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Archaeology of the Malnad Region

COMPRISING THE DISTRICTS OF
HASSAN, CHIKMAGALUR AND SHIMOGA
WITH SPECIAL REFERENCE TO PRE AND PROTO HISTORY

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M.A., Dip. in Arch

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C E R T I F I C A T E

This is to certify that the thesis entitled **'ARCHAEOLOGY OF MALNAD REGION COMPRISING THE DISTRICTS OF HASSAN, CHIKMAGALUR AND SHIMOGA WITH SPECIAL REFERENCE TO PRE AND PROTO HISTORY'** submitted by Shri K.P. Poonacha, for the award of the Degree of Doctor of Philosophy in Ancient Indian History and Epigraphy, Karnatak University, Dharwad, is based on original source material collected by him through field work. The thesis or part thereof has not been previously submitted for any other degree.

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Chapter I

Introduction

Archaeological research in India, in its true sense, was started as early as in 18th century. About two hundred years of research conducted on various aspects of Archaeology by the Government agencies, private organisations, individual researchers and other Indian and foreign academic institutions, have unravelled a number of startling facts about our ancestors, their material culture, history, customs, traditions and religion right from the pre-historic times upto the modern times.

Influence of certain important factors such as the environmental conditions and great diversity in topography on the cultural developments in this vast country is so much that, they vary from region to region. The peninsular India characterised by 'Archaeans' - the oldest geological strata - is one such major region which on the geographical and topographical features may be divided into further sub zones. Karnataka "a table land situated in the angle where the eastern and western ghats converge towards the Nilagiri hills" (Krishnan, 1956) forms one such important zone.

The present study is aimed to bring to the focus essentially the pre and proto-historic cultural aspects of the 'Malnad' region of Karnataka which is hardly known. Sporadic explorations resulting in the discovery of a Lower Palaeolithic site here or a Megalithic site there seem to indicate the potentiality of the region in pre-historic remains.

Pre-historic investigations in the archaeologically rich Karnataka state was begun by Robert Bruce Foote in the last quarter of 19th century. Since then as many as five scholars have systematically explored and studied several pre-historic sites in different river valleys and other regions in Karnataka. The most noteworthy studies are by Joshi in Malaprabha river (1955), Seshadri in some parts of southern Karnataka (1956), Banerjee in Bagalkot region (1957), Paddayya

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in Shorapur doab (1968), Pappu in Krishna basin (1974) and recently again by Paddayya in Hunsgi (1982). These studies have basically contributed to the understanding of the pre-historic cultures as well as the Geomorphology of the region from a simple systematic field survey. They also indicate application of the advanced techniques in the study of the sites and materials that in course of time enable to extract more meaningful information about the pre-historic man and his environments most scientifically, as for example, Dr. Paddayya's work on Hunsgi (1982).

Excavations of Neolithic habitational sites and ashmounds such as Brahmagiri (Wheeler, 1948), Sanganakallu (Subba Rao, 1948), (Sankalia, Ansari, Nagaraja Rao, 1969), Tekkalakota (Nagaraja Rao, 1965), Kupagal (Majumdar and Rajaguru, 1966), Hallur (Nagaraja Rao, 1971), etc. indicate that the area of research in this field is centered mostly in northern Karnataka. Research on Iron Age Megalithic cultures has also been taken up extensively in this region. Particular mention may be made of the work done by Sundara (1975) on the Megalithic culture of northern Karnataka, opening new vistas in understanding the beginning and spread of this culture.

The problem: With this background, if we look at the progress so far made in the Archaeological research, particularly from the point of view of pre and proto-history of southern Karnataka, no problem oriented or systematic research seems to have been attempted except the pioneering work of Dr. Seshadri. As already noted, but for a few Lower Palaeolithic sites reported such as at Nyamti, Nidaghatta, Lingadahalli, Kadur (Bruce Foote, 1901), Kibbanahalli, Biligiri (Sampath Aiyangar, 1924), etc., not much is known about the pre-history. T. Narasipur (Seshadri, 1971), Hemmige (Hanumantha Rao & Nagaraju, 1974) both in the Upper Kaveri valley in Mysore district and Banahalli (IAR, 1983-84) in Kolar district are the only three Neolithic sites systematically excavated so far in this region though numerous sites have been reported.

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As far as the Megalithic problem is concerned, a number of burial sites are reported from various districts. However, only three sites namely Jadigenahalli (Seshadri, 1960) near Bangalore, Heggadahalli and Koppa (1977) in Coorg and Mysore districts respectively have been excavated so far. Subbaiah's (1972) recent work on Coorg Megaliths also does not provide a comprehensive picture of the Megalithic culture in the southern Karnataka as the study is restricted to Coorg district only.

From the above observations, it is clear that the area in and around Krishna and Bhima valleys are comparatively better investigated and a wealth of meaningful material is available on the development and expansion of various cultures and bearing on their chronoligical sequences so far as the northern Karnataka is concerned.

Chronological sequence of the Palaeolithic cultures of southern Karnataka has not been ascertained due to lack of sufficient problem oriented surveys, essentially of the river valleys, as has been done in the river valleys of northern Karnataka. However, it is gratifying to note that recently teachers of the Ancient History and Archaeology and Geology of Mysore University are trying to examine the Kaveri valley with an inter-disciplinary approach (Gururaja Rao and Shivarudrappa, 1989). Archaeological investigations particularly in the upper Kaveri valley, though reveal certain peculiarities in the material culture of the Neolithic people, they do not furnish evidence about the mutual contacts, if any, with the sites reported from northern Karnataka. Coming to the Megalithic culture, we have sufficient information about the chronology and spread of Megalithic burial types in so far as the eastern, northern and a part of southern Karnataka. However, their chronology and spread in the remaining part in relation to the above said areas have not been attempted so far.

Hence, in order to understand the range and cultural diffu ons from northern Karnataka to southern Karnataka, if any, on the one hand and the regional peculiarities on the other, a detailed study o the

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archaeologically little known intermediary region comprising Shimoga, Chikmagalur and Hassan districts forming the south western part of Karnataka is necessitated. This intermediary region 'Malnad' or 'High land' with distinct geographical features and climatic conditions seem to have played a vital role in the movement and spread of the culture right from the beginning of human existence. With this study it is believed a grand picture of the outline of the pre-historic cultures of Karnataka becomes almost entirely known.

Previous work done in the 'Malnad'·

With the exception of the general notes on the Megalithic burials by Mackenzy (1873) and a descriptive note on the Palaeoliths from Nyamti, Nidaghatta and Lingadahalli by Robert Bruce Foote (1901) detailed information is not available about the few sites reported subsequently. However, these sites are tabulated below in a chronological order highlighting their features.

Table No. 1

Sites explored earlier (Until 1977) in 'Malnad'

Sl. No.	District / Taluk	Site	Year of discovery	Author	Cultural milieu	Remarks/ reference
1	2	3	4	5	6	7
1	Hassan / Arkalgud	Sompura	1872	J.S.F. Mackenzy	Megalithic burials, Black and Red ware	Indian Antiquery Vol. No.2 p. 7-11
2	Shimoga / Honnali	a) Nyamti b) Nidaghatta c) Lingadahalli d) Kadur	1881	R B. Foote	Lower Palaeolithic tools comprising choppers, hand axes, flakes, etc made on quartz and quartzite	R.B. Foote 1961 (Reprint)

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1	2	3	4	5	6	7
2	Shimoga Honnali	e) Mudigere f) Kotigehara	1881	R.B. Foote	Iron smelting site and	R.B. Foote 1961 (Reprint)
		g) Kaldurga	1881	-do-	Dark grey chert flake with working edge	-do-
3	Hassan	Payagod	1881	-do-	Broken part of a ring stone	Whether it had any prehistoric appendage is not known.
4	Hassan Belur	a) Gumni b) Pungame c) Honnavara d) Kondajji	1954	Seshadri	Megalithic burial sites	Only types are described. Other details are not known.
		e) Kardigudda			Solitary Lower Palaeolithic ovate	
5.	Chikmagalur Sringeri	Beluvinakudige	1968	G.R. Sundara	Megalithic burials	The site is situated at a higher altitude. A. Sundara has described the types in 1974.
6.	Shimoga Hosanagara	Nilaskal	1974	A. Sundara	Neolithic Brown and Black Ware and Menhirs	There are 30 or more menhirs in one locality. (Hulikal pass leading to coastal region is nearby).
7	Shimoga Tirthahalli	Arehalli	1974	A. Sundara	Neolithic pottery, Megalithic burials.	Disturbed site. Megalithic Dolmenoid cist.

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1	2	3	4	5	6	7
8	Shimoga Shimoga	Guddemaradi	1974	A. Sundara	Neolithic pottery and stone implements.	A. Sundara mentions the influence of Chalcolithic culture.
9	Shimoga Hosanagara	Halenagara	1975	-do-	Neolithic Burnished Grey ware.	-
10	Shimoga Honnali	(a) Anveri (b) Nagasamudra	1976	Dept. of Archaeology, Govt. of Karnataka	Neolithic pottery and stone implements	These are collected by local Head Master and now kept in the School.
11	Shimoga	(a) Ashoka-nagara	1977	K.P.P. Tejasvi, S. Ramachadra Rao	Neolithic implements	Eastern most Neolithic site reported from this region.

Environment' As a background to the present study, it is necessary to have a sound idea of the Geology and Geography of the region which has direct bearing on the development of pre-historic and proto-historic cultures.

The 'Malnad' region under study forms the south-western part of the Karnataka state and is situated roughly between the parallels 12°31' and 14°35' northern latitude and 74°35' and 76°40' eastern longitude covering an area of about 13,992 Sq Km The region is bounded on the north-east by Chitradurga, south-east by Mandya, south by Coorg; west by Dakshina Kannada and north-west by Uttara Kannada districts. Physiographically it can be divided into three zones namely (a) 'Malnad' with mountainous tracts, intervening valleys covered with evergreen forests (b) Semi Malnad covered with semi evergreen and wet

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deciduous forests and (c) 'Maidan' a well cultivated open country interspersed with isolated hills and hill clusters either almost bare or composed of dry deciduous and thorny scrub belt.

Hills: In fact, the region is pre-eminently a high land tract also known as the western ghats running in almost north-east and south-west orientation with sudden escarpments and acts as a stupendous barrier between the coastal plain on the west and Midan on the east, besides accommodating numerous passes of which, Agumbe, Hulikal, Kollur and Bisle are noteworthy for, we have a few pre-historic sites in the vicinity of these passes. This high land also accommodates some of the tallest peaks of the region, Mullayanagiri (1926.7 m) and Chandragutti (848 m) representing respectively the maximum and minimum heights.

Rocks and Minerals: Geologically 'Malnad' region is very stable. The salient rock formations are the Dharwar schists, with which are found highly altered sedimentary rocks such as quartzite, conglomerates, lime stone, traps and shales. Majority of the Lower Palaeolithic tools are made on quartzite. Trap and quartz derived from schists have also been used for fashioning tools. Another important rock formation is granitic gneissic having sub-groups namely granite and granitic gneisses with variation in structure, texture, colour, etc. Laterite of tertiary age is another important rock formation in the region, found in small patches in Shimoga and Hassan districts.

The region is known for a variety of minerals. There are in all twentynine varieties of minerals found in the three districts. Some of these include bauxite, beryl, soapstone, asbestos, corundum, feldspar, graphite, mica, manganese, titanium, etc.

Drainage: A number of rivers draining the region originate from the high western ghats. The most important among them being Kaveri, Tunga, Bhadra, Tungabhadra, Sharavati and Hemavati. Other small rivers include Kumudvati, Varada, Vedavati, Yagachi, etc., all tributaries of the above major rivers. It is worthy to note that the river Krishna

and her tributaries and the middle and upper Kaveri with her tributaries drain the adjacent northern and southern part of the 'Malnad' respectively.

Climate: Climatically the 'Malnad' region, a greater part of which has hilly terrain, is on the whole agreeable and cool. The year may be divided into four seasons according to the climatic conditions. The summer season with steady increase in the temperature is from March to May. The period from June to September constitute the south-west monsoon season. October and November may be termed as post-monsoon season followed by cold (winter) season with clear bright weather from December to February.

Temperature: In this region April is the hottest month with a mean daily maximum temperature rising on an average upto 35°C while mean daily minimum temperature is about 20°C on an average. On individual days during the summer the temperature varies from 38°C to 35°C. During monsoon the temperature drops and becomes too low during the cold season.

Rain-fall: The south-western and part of western region which include the western ghats receives heavy rain fall. The rain fall decreases rapidly from the west to the east.

Average annual rain fall in the region is as follows:

Region	Annual average railfall
a) Northern part (Shimoga district)	1526.5 mm
b) Southern part (Hassan district)	1047.7 mm
c) Central part (Intermediary Chikmagalur district)	1989.8 m
d) The eastern part of the above three districts.	varies between 650 mm to 600 mm

Table No. 2

Rainy days (with 2-5 mm or 10 cents or more)

District	No. of days	Percentage of rain fall received during monsoon
Shimoga	80	79
Chickmagalur	92	79
Hassan	68	52

Agumbe on the western ghats in Shimoga district, receives 8275.7 mm (325.82") annual rainfall and is the second highest rainfalling area in India after Chirapunji in Assam, while Honnali to the north-west of Shimoga in the maidan receives 611.7 mm (24.08") of the lowest annual rain fall. Sringeri in the western part of Chickmagalur district receicves 3695.1 mm (145.48") annual rainfall while Kadur in the eastern part of the district receives only 603.6 mm (23.76") rainfall annually, Sakaleshpur in the west of Hassan district receives 3248.7 mm (92.47") annual rainfall while Arsikere in the east of the district receives 673.1 mm (26.50") rainfall annually.

The large spatial variation noticed above clearly indicates that areas in and around western ghats of the region gets heavy annual rainfall which decreases rapidly as one proceeds towards the east from the 'ghat' region.

Soils: The soils of 'Malnad' region show a marked diversity depending upon the nature of the parent rock and climatic conditions of the respective areas. The chief soil forming rocks in the region under study are schists, granites, gneisses and laterites. Black cotton soil is confined to the medium to low rain falling area in the region.

Red loamy soils occur in different localities of the region with less percentage of Nitrogen, Phosphorus and Potash and are generally acidic to neutral.

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Red sandy soil occur in different areas in the region are derioved from Schists, Granite and Gneisses are red to brownish in colour and loamy to sandy in texture. Soils of Laterite origin occur only in northern and sosuthern parts of the region. It is red to yellow in colour and is generally acidic in nature. Soils in the 'Malnad' areas are well supplied with organic matter whereas the soils of maidan area contain only about 10 percent of organic matter.

Table No. 3

Soils favourable for crops grown in the region under rain fed and irrigated conditions

Laterite soil	Black soil	Red sandy soil
a) Paddy	a) Cotton	a) Paddy
b) Coffee	b) Wheet	b) Ragi
c) Tea	c) Jower	c) Millets
d) Sugarcane	d) Gram	d) Pulses
e) Areca	e) Millets	e) Oil seeds
f) Plantains	f) Oil seeds	f) Sugarcane
g) Pepper		g) Areca
h) Fruits		h) Plaintain
i) Cardamom		i) Chillies
		j) Potato
		k) Groundnut
		l) Jower
		m) Cotton
		n) Vegetables

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Flora: The flora of the region under study is varied and rich due to variation in climate particularly rainfall (minimum 603 mm; maximum 8275 mm) resulting in rapid transition from scrub to the evergreen flora as one moves from east to west. The flora of the region may be broadly classified as follows depending on the altitude at which they are situated.

a) Evergreen trophical forests· Interspersed with evergreen grassy slopes.

b) Semi evergreen and wet deciduous belt and

c) Dry deciduous and thorn scrub belt

Over 60 important species of trees are known from the region including varieties of shrubs. Wild fruits of different variety also occur in this region in different seasons.

Fauna: The rich tropical forests have also become rich game-sanctuary as is evident from the numerous species of animals, birds and fishes that are seen moving freely in the forests and waters. Almost all major groups of Indian mammals are found in this region. Due to abundant availability of vegetable food and insects a good number of bird species are also found in the woods of 'Malnad'. Raptiles in this region include snakes, crocodiles, lizards, tortoise, chameleon, etc. Different species of amphibians and fishes are abundantly found in most of the rivers and tanks of this region. Besides domestic animals for day today use are also found (District Gazetteers, 1971, 1975 and 1981).

The above brief note on the geological and geographical aspects of the region indicate that the region no doubt has thick evergreen forest beset with dangerous animals. However, elsewhere it is known that stone age man was able to prey even large and mighty animals like mammoths. What was perhaps needed in an environment like that of 'Malnad' was the development of different devices to interact with the

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fauna of the region. It is also noteworthy that, the region rich both in flora and fauna with abundant water supply and rock materials suitable for making tools, wealth of minerals such as iron and copper, attracted pre-historic people of both the Palaeolithic and the Neolithic cultural stages. Extensive and large scale excavation of some select sites may yield data pertaining to the life style of the people here that is likely to be distinct from the contemporary mode of life of the people in the maidan area.

Political History: As briefly outlined above; the Malnad region, endowed with abundant natural resources, continuous water supply and having conducive climate has been the home of human culture from the very pre-historic times. With the emergence of the first and the second urbanisations respectively coinciding with the Neolithic/Chalcolithic and Iron ages, the area appears to have been occupied by more and more number of people. Especially with the favaourable coastal strip and the hinterland with abundant resources of forest products and large cultivable lands yielding ecnomic products like the spices, etc., the region was quite affluent and became the stage for the political activities duing the early centuries of the Christian era.

Banavasi province, covering part of the Malnad region, was quite well known during the Mauryan times and Emperor Asoka was prompted to send the Buddhist missionery for the propagation of the Dhamma in this area. The Cylonese chronicles refer to many Buddhists as well as stupas of Banavasi. Huen Tsiang, the Chinese traveller, too mentions about the stupas of which he had heard much. Later in time, among the successors of the Satavahanas of 'Paithan', the Chutus were ruling from Banavasi amply patronising Buddhism. During this time, Banavasi seems to have had trans-oceanic trade contacts with the western countries. Roman coins found at Banavasi as also at Akki Alur in the neighbouring Dharwar district (Nagaraja Rao, 1987) issued by Roman kings Augustus and others support this view. Probably, it is these factors, that

attracted Kadamba kıng Mayura Sarma, haılıng from Talagunda (an anıent agrahara ın the near proxımıty of Banavası) to have the 'capıtal' of hıs newly found kıngdom, the fırst ındependent and natıve kıngdom of Karnataka, at Banavası.

The Kadambas ruled over the entıre Malnad regıon for over two centurıes (A.D. 325 - 540). Thereafter, they were subjugated by the Chalukyas of Badamı (A.D. 500 - 757) and contınued to rule as feaudatorıes under them. After the Kadamba epoch, the regıon formıng part of the Banavası - 12000 provınce, was ruled by the collateral branches of the Kadambas, lıke the Kadambas of Hangal, Goa, Belur, etc. as feaudatorıes of the major rulıng dynastıes lıke the Rashtrakutas (c. 756 to 973 A.D.), Chalukyas of Kalyana (A.D. 973 to 1189) and the Seunas (Yadavas of Devagırı) (c. 850 to 1334 A.D.) (Kamat, 1980).

The next and the only ımportant dyansty that sprang ın the Malnad regıon ıs that of the Hoysalas of Dora Samudra (modern Halebıd). Orıgınatıng as petty Chıefs of the Malnad ın the Sosevur (ancıent Sasakapura) area (Chıkmagalur dıstrıct), the Hoysalas were ambıtıously buıldıng up a kıngdom and succeeded ın theır efforts ın the early decades of 12th century through Vıshnuvardhana of the famıly. Interestıngly they had among theır ımperıal tıtles 'Maleparol ganda' (husband of the hıll Chıefs) sıgnıfyıng theır orıgın ın and overlordshıp over the Malnad regıon. The most ımportant among the rulers of thıs dynasty are Vıshnuvardhana (A.D. 1108 - 1152), Ballala II (A.D. 1173 - 1220) and Narasımha II (A.D. 1200 - 1239).

The contrıbutıon of the Hoysalas to the hıstory, art, archıtecture and religıon upto theır dısappearance ın the mıddle of the 14th century A.D. from the polıtıcal scene, ıs so spectacular that theır rule occupıed a dıstınct place ın the hıstory of Indıa ın general and that of Karnataka ın partıcular. Theır contrıbutıon ın the fıeld of archıtecture, especıally ıs unparallel as ıs evıdent ın the form o

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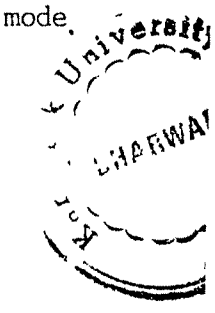
number of ornate temples built all over the dominion. The small and medium sized temples of the period are characterised by stellate plan, high platform, articulation of the walls, highly polished lathe turned pillars, decorative sculptures of intricate workmanship and restrained elegance of the sikharas over the single, double or triple shrines, all constituting to a seperate style by itself known as the Hoysala style. Undoubtedly it represents the 'supreme climax of Indian architecture'.

In the field of religion, the Hoysala rule witnessed the emergence of Srivaishnavism, profounded by Sri Ramanujacharya and Vaishnavism, profounded by Sri Madhvacharya. Sri Ramanujacharya was instrumental in making Vishnuvardhana to accept Srivaishnavism. Literature too flourished during the period. The prose work 'Gadya Karnamrita' by Vidya Chakravartin, Sri Bhashyam and other works expounding the philosophy of qualified monism by Sri Ramanuja are among the noteworthy Sanskrit works, Rajaditya's Vyavahara Ganita' and 'Lilavati' are the important treatises on mathematics. Ramachandra Chaita Purana (or Pampa Ramayana) of Nagachandra, Neminatha Purana of Nemichandra, Vardhamana Purana of Achanna, and the classic Kannada literary work 'Yesodhara Charite' of Janna are some of the outstanding works in the Kannada literary work (Diwakar, 1968).

After the illustrious rule of the Hoysalas, the region became part of the Vijayanagara Empire and was variously administered by small feudatories. In the post-Vijayanagara period many of these feudatories like the Nayakas of Keladi, Ikkeri, etc., began their independent rule over this region.

Thus, politically and culturally one could see a continuous and brilliant career in the history of this region right upto the mode period.



Method of work: Keeping the above defined problem in view, the entire strip of land ranging from 10 - 20 Km from the river bank, on both the sides of the river Upper Tungabhdra from Hallur upwards upto the confluence at Kudli, the Tunga, the Bhadra, the Hemavati upto their origin and a stretch of 30 Kms of the Upper Kaveri in Hassan district were intensively explored for, it is too well known that the pre-historic people were essentially moving about or settled down in the river valleys and the earlier stray discoveries indicated the same. It is only with regard to the Iron Age Megalithic culture that the Megalithic burials are found in the hilly terrains for the obvious reasons that the necessary suitable rock material could be obtained and used there.

So far 92 sites are noticed in these river valleys. Of them 40 are in the Upper Tungabhadra, 15 sites in the Bhadra, 17 sites in the Tunga, 14 sites in the Hemavati and 7 sites in the Kaveri. Remains of different cultures found in these sites are categorised as follows: Lower Palaeolithic 26, Middle Palaeolithic 8, Upper Palaeolithic 1, Mesolithic 45, Neolithic 22 and Megalithic 36. A map and also a table displaying the distribution of different cultures in different river valleys are appended herewith (Fig. 1).

During the exploration every bit of information with regard to topography, natural resources, nature and extent of the site, etc., has been taken note of. It may also be noted here that during exploration, an attempt has been made to collect as far as possible all kinds of materials without any bias for any kind of antiquity. The explored materials have been carefully analysed quantitatively and topologically. After noting every bit of the antiquities, selection has been made on the basis of typology and technology and also of the unusual types and material. At relevant places (below in all the 2-6 chapters) analysis are given to ascertain the preference of certain types by the pre-historic people. It is true, that these analysis are based on the materials collected from the surface and the implications

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arrived at are not likely to be wholly exact. Hence, the observations made are bound to be provisional for understanding the life-style of the pre-historic people as much as possible.

Wherever available, the river cliff sections have been studied in relation to the cultural remains noticed in the nearby sites. Although lack of resources did not permit me to excavate one or two select sites on a large scale, a small trial dig was attempted in a potential site in the Upper Tungabhadra valley to obtain more information of the proto-historic cultures and to put the explored materials more accurately into a proper stratigraphical and chronological perspective. However, on the basis of comparisons with the known sites, the explored materials (Palaeoliths and Mesoliths) have been studied in the first instance river-valley-wise and then culture-wise. This has been done to find out variations in cultural indices river-valley-wise if there be any and the development of the culture through the ages.

So far as the treatment of the subject is concerned, it is dealt with in three parts, viz. (1) Explorations (2) Description and analysis and (3) observation and conclusions.

Terminology: For the sake of convenience and to maintain uniformity, I have used the widely accepted terms like Lower Palaeolithic, Middle Palaeolithic, Upper Palaeolithic, Mesolithic, etc. while describing the various pre-historic lithic industries noticed by me in the river valleys of Malnad region. The present study does not warrant revision or introduction of new items in the existing accepted terminologies with regard to pre-historic cultures.

Note: To highlight the various salient features of sites, these have been arranged in a tabular form river valley-wise and district-wise. Wherever essential, district name is included in the margin itself. The details against Roman letters and Alphabets used in the table are as follows:

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Roman letters I to VI indicate:

I - Taluk; II - Village; III - Latitude, Longitude,
IV - Environs (a) Geological/Geographical features;
(b) Locus; (c) Tentative stratigraphy;
V - Culture - Cultural milieu/artefacts/raw material
VI - Extent of the site and the present condition.

Capital Alphabets indicate:

A - Lower Palaeolithic; B - Middle Palaeolithic;
C - Upper Palaeolithic; D - Mesolithic;
E - Neolithic; F - Megalithic

(1) THE UPPER TUNGABHADRA VALLEY (SHIMOGA DISTRICT)

No. 1

I. Honnali
II. Konaikanahalli, 2 Km south-west of the village.
III. 75°38'15" East, 14°15'30" North.
IV. (a) Maidan features, red soil, Quartz lumps.
(b) 2 Km west of the river Tungabhadra, on an elevated area.
(c) Red soil, Gneiss.
V. (D) Mesolithic - Non-geometric; Scrapers, Points, irregular flakes made on Quartz.
VI. 25 m east-west x 30 m north-south; under cultivation.

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No. 2

I. Honnali

II. Hale Arlehalli, 2 Km south-west of the village.

III. 75°37'15" East, 14°8' North.

IV. (a) Maidan features, red soil, quartz lumps, scanty vegetation. Small hillock to the south-east of the site.

(b) 1.2 Km west of the river Tungabhadra on an elevated area.

(c) Red soil, gneiss.

V. (D) Mesolithic - Non-geometric bladish flakes, double points, scrapers made on milky and grey quartz.

VI. 30 m east-west x 30 m north-south; site is under cultivation.

No. 3

I. Honnali.

II. Honnali, 2.2 Km north of Honnali town.

III. 75°38' East, 14°15' North.

IV. (a) Maidan features, scanty vegetation. Red soil. Quartz lumps and pebbles.

(b) 150 m west of the river Tungabhadra.

(c) Red soil, gneiss.

V. (D) Mesolithic - Non-geometric points, scrapers. Blades made on quartz.

VI. 60 m east-west x 30 m north-south; site is under cultivation.

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No. 4

I. Honnali

II. Didagur, 5 Km south-west of Honnali town.

III. 75°40'East, 14°12'30" North

IV. (a) Maidan features; scanty vegetation. Bamboo stems along the river. Red soil.

(b) 50 m. south of the village.

(c) Red soil, Gneiss.

V. (E) Neolithic - Ground stone tools, pottery and White painted Black and Red ware.

(F) Megalithic - Black and Red ware, All Black ware.

VI. 2 acres; disturbed.

No. 5

I. Honnali

II. Haralahalli, 6 Km south of Honnali town.

III. 75°37'30" East, 14°18' North

IV. (a) Maidan features, scanty vegetation. Quartz pebbles, reddish loose soil mixed with gravel. Surrounded by black soil fields.

(b) 1.5 Km west of the river Tungabhadra.

(c) Red soil, gneiss.

V. (D) Mesolithic - Non-geometric scrapers, points, rejected cores, all made on Quartz.

VI. 30 m east-west x 50 m north-south, site is under cultivation.

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No. 6

I. Honnali

II. Govinkovi

III. 75°40'30" East, 14°10' North

IV. (a) Maidan features, scanty vegetation. Small nullah runs in east-west orientation near the site. Pebbly gravel patch, water weeds in the river bed.

(b) 1.5 Km east of the village in the river bed.

(c) Red silt, pebble gravel, Gneiss.

V. (A) Lower Palaeolithic

(B) Middle Palaeolithic

Core and flake tools of small size include hand axes, discoids, rectangular shallow scrapers. Quartzite.

VI. 20 m east-west x 100 m north-south. Loose gravel bed.

No. 7

I. Shimoga

II. Kotehalu, 20 Km south of Honnali.

III. 75°42'5" East, 14°8'15" North

IV. (a) Maidan feature, scanty vegetation, grey soil.

(b) 50 m south of the village.

(c) Grey soil, Gneiss.

V. (E) Neolithic - Coarse Grey ware, Butt end of a ground stone axe

VI. The mound measures 150 m east-west x 100 m north-south, 1 m height, disturbed.

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No. 8

I. Honnali

II. Hadonahalli, south of Honnali town.

III. 75°39' East, 14°16'30" North

IV. (a) Maidan feature, 1 Km west of left bank of the river in a pit section pebbles are noticed. Quartz lumps in habitation site.

(b) River bed (Palaeolithic). Ancient habitation mound 200 m south of the village.

(c) Red sandy silt, gravel, Gneiss.

V. (A) Lower Palaeolithic - Hand axe.

(E) Neolithic - Coarse Black and Brown ware, Burnished Grey ware, Ring stone, etc. White painted Black and Red ware.

(F) Megalithic - Black and Red ware, Two rectangular cairns.

VI. 60 m north-south x 80 m east-west, Extant portion of the disturbed mound measures 1.5 m in height.

No. 9

I. Shimoga

II. Hole Hanasavadi, 8 Km east of Shimoga town.

III. 75°37'30" East, 13°56'30" North.

IV. (a) Maidan features. Sparse vegetation. Grey soil.

(b) 100 m south - south-west of the village.

(c) Red silt, Gneiss.

V. (E) Neolithic - Brown and Black ware, Burnished Grey ware, Black ware. Neolithic stone tools showing various stages of manufacture. Ground stone chisel, axe, hammers, etc. White painted Black and Red ware.

(F) Megalithic - Black and Red ware, All Black ware.

VI. 2 acres, disturbed due to agricultural activity.

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No. 10

I. Shimoga
II. Holehatti, south of Honnali town.
III. 75°40'30" East, 14°1'30" North
IV. (a) Maidan features, sparse vegetation, Grey soil.
(b) Eastern fringe of the village.
(c) red silt, Gneiss.
V. (E) Neolithic - Brown and Black ware, ground stone axe.
(F) Megalithic - Black and Red ware.
VI. 50 m east-west x 60 m north-south; under cultivation; disturbed.

No. 11

I. Honnali
II. Haraganahalli, 8 Km north of Honnali town.
III. 75°38'30" East, 14°20'30" North.
IV. (a) Maidan features with chain of small hillocks, schist outcrops on the hillocks. Blackish grey soil.
(b) On the slopes of a hillock and 50 m east of the river bank.
(c) Reddish silt, Gneiss.
V. (D) Mesolithic - Scrapers, points, blades, cores, etc made on Quartz.
(E) Neolithic - Brown and Black ware, Pinkish Blotchy ware, celts showing different stages of manufacture, rubbers, pestle, etc, White painted Black and Red ware.
(F) Megalithic - Menhirs on the hillocks, Black and Red ware, All Black ware, Red ware, etc.
VI. (D) Spread in 50 m x 20 m area.
(E) Spread in 2 acres. Site under cultivation.
(F) Found mixed with Neolithic pottery.

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No. 12

I. Honnali

II. Belamallur, 6 Km north of Honnali town.

III. 75°39' East, 14°16'30" North.

IV. (a) Maidan feature. Scanty vegetation, red soil.
(b) 2 Km north of the village, 50 m east of right bank.
(c) Reddish silt, Gneiss.

V. (E) Neolithic - Brown and Black ware, Burnished Pinkish Grey ware, Burnished Grey ware, Ground stone axes, hammers, wedge, etc. Non-geometric microliths, White painted Black and Red ware.

(F) Megalithic - Menhir, Black and Red ware (Graffitti), All Black ware.

VI. (E) Mound measuring 10 acres, totally disturbed due to cultivation.

(F) Found mixed with Neolithic pottery.

No. 13

I. Honnali

II. Gollarahalli, 3 Km south-east of Honnali town.

III. 75°40'15" East, 14°14'15" North.

IV. (a) Maidan feature. Sparse vegetation, Red soil.
(b) 10 m towards east of river bed.
(c) Gneiss, Red silt.

V. (D) Mesolithic - Non-Geometric scraper, points, bladish flakes, made on Quartz.

VI. Tools found scattered on the slopes in an area of 50 sqm.

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No. 14

I. Honnali

II. Thakkanahalli, 7 Km south-east of Honnali town.

III. 75°42' East, 14°14' North.

IV. (a) Maindan feature, scanty vegetation, quartz and chert nodules, Blackish soil.

(b) 50 m east of the river on an elevated area.

(c) Gneiss, Blackish red soil.

V. (B) Middle Palaeolithic - Scrapers, points, etc made on chert and quartzite.

(C) Upper Palaeolithic - Blades, burins, points made on chert, quartzite and quartz.

(D) Mesolithic - Blades, points, scrapers, Bladish flakes, etc., all made on quartz.

VI. About 2 acres, under cultivation, disturbed.

No. 15

I. Honnali

II. Benakanahalli, 10 Km south-east of Honnali town.

III. 75° 43'30" East, 14°13'30" North.

IV. (a) Maidan feature, scanty vegetation, red soil.

(b) 20 m east of the river.

(c) Reddish silt, Gneiss.

V. (D) Mesolithic - scrapers, bladish flakes, etc made on quartz.

(E) Neolithic - Burnished Black and Grey ware, Brown and Black ware, White painted Black and Red ware.

(F) Megalithic - Black and Red ware, All Black ware.

VI. (D) 4 acres, partially disturbed.

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No. 16

I. Honnali

II. Chikbasur, 6 Km south-east of Honnali town.

III. 75°42'45" East, 14°12' North

IV. (a) Maidan feature. Brownish soil.

(b) Palaeoliths in the river bed. Mesolithic on red silt deposit about 10 m away from the river bank.

(c) Red silt, gravel, Gneiss.

V. (A) Lower Palaeolithic - Tools of medium size made on quartz pebbles.

(B) Middle Palaeolithic - Points, scrapers, etc.

(D) Mesolithic - Non-geometric points, scrapers, made on quartz.

V. (A) and (B) Gravel bed.

(D) Disturbed.

No. 17

I. Honnali

II. Ayanur, 7 Km south-east of Honnali town.

III. 75°37'30" East, 14°9' North.

IV. (a) Maidan features, scanty vegetation. Ashy grey soil.

(b) South-east of the river bank.

(c) Brownish silt, Gneiss.

V. (E) Neolithic - Blackish Grey ware.

VI. 100 m in circumference, disturbed.

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No. 18

I. Honnali

II. Sasivehalli, 34 Km east of Shimoga town.

III. 75°42'30" East, 14°9' North.

IV. (a) Maidan features. Scanty vegetation. Brownish soil.

(b) South-east of the village near the fort.

(c) Reddish silt, Gneiss.

V. (D) Mesolithic - Bladish flakes, scrapers, points made on quartz of Non-geometric group.

(E) Neolithic - Blackish Grey ware, Burnished Pinkish Grey ware.

(F) Megalithic - All Black ware.

VI. 2 acres, site is under cultivation and disturbed.

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No. 19

I. Honnali

II. Hosahalli, 32 Km north-east of Shimoga

III. 75°43' East, 14°8' North.

IV. (a) Maidan features, scanty vegetation, grey soil.

(b) 60 m east from the river bed.

(c) Greyish soil, Gneiss.

V. (E) Neolithic - Coarse Brown and Black ware, White painted Black and Red ware.

(F) Megalithic - Black and Red ware.

VI. 2 acres, disturbed.

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No. 20

I. Honnali

II. Halelingapur, 30 Km north-east of Shimoga town.

III. 75°42'30" East, 14°6' North.

IV. (a) Maidan feature, scanty vegetation, grey soil.

(b) 50 m east of river bank.

(c) Greyish soil, Gneiss.

V. (D) Mesolithic - Non-geometric comprising scrapers, point and cores, all made on quartz.

(E) Neolithic - Burnished Grey ware, Ground stone axes, White painted Black and Red ware.

(F) Megalithic - Black and Red ware.

VI. 100 m east-west x 100 m north-south. Site is disturbed due to cultivation.

No. 21

I. Honnali

II. Hanagavadi

III. 75°43' East, 14°5'30" North.

IV. (a) Maidan features, scanty vegetation. Reddish soil. Gravel patch.

(b) 2 Km south-west of the village on an eminence.

(c) Red soil, Gneiss.

V. (D) Mesolithic - Non-geometric scrapers, points, etc all made on quartz.

VI. 100 Sq.m under cultivation.

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No. 22

I. Honnali

II. Salabalu, 4 Km north of Savalanga

III. 75°32'30" East, 14°7'30" North.

IV. (a) Maidan feature, scanty vegetation. Hillock and granite outcrops, reddish soil.

(b) 1 Km west of the village.

(c) Red soil, Gneiss.

V. (D) Mesolithic - Scrapers, points, etc of non-geometric group made on quartz.

VI. 30 m east-west x 35 m north-south; found near two small granite outcrops.

No. 23

I. Honnali

II. Surahonne, 2 Km west

III. 75°33' East, 14°8'45" North.

IV. (a) Maidan feature, scanty vegetation, Granite outcrops, Red soil, laterite near the hillock. Kudre Konda gold strip is nearby.

(b) 0.2 Km south of the village.

(c) Red Soil, granite.

V. (D) Mesolithic - Scrapers, points, flakes on quartz of non-geometric group.

VI. The site measures 25 m east-west x 40 m north-south. Quartz lumps are found scattered in the site.

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No.24

I. Honnali

II. Nyamti, 35 Km west of Shimoga town.

III. 75°35'30" East, 14°9'45" North.

IV. (a) Maidan feature, scanty vegetation. Brown soil. Granite outcrop and loose pebbles in the fields.

(b) Near the local school.

(c) Red Soil, Shingle bed, granite.

V. (A) Lower Palaeolithic - Hand axes, scrapers, made on quartzite.

(D) Mesolithic - Scrapers, points, flakes made on quartz of non-geometric group.

(F) Neolithic - Ground axe.

VI. (A) In the fields amdist loose pebbles (Shingle bed) R.B. Foote collected pebble tools in 1881. Most types are found now.

(D) found embedded in sections of a nullah.

(F) Disturbed site.

No. 25

I. Honnali

II. Sunkadakatte

III. 75°38' East, 14°13' North.

IV. (a) Maidan feature, scanty vegetation.

(b) Towards the north of the village at a distance of about 1.5 Km near 'Malladevarakatte'.

(c) Red soil, granite.

V. (F) Megalithic - Cairns.

VI. 1.8 to 2.5 m dia. Most of them disturbed, in an area of 200 m circumference.

No. 26.

I. Honnali

II. savalanga

III. 75°32' East, 14°6' North

IV. (a) Maidan feature, scanty vegetation.

(b) Towards north-east of Savalanga, 1 Km away at Veerapura.

(c) Red soil, granite.

V. (F) Megalithic - Stone circles.

VI. Completely disturbed stone circles in an area of 3 - 8 acres (Recent examination revealed total destruction).

No. 27

I. Honnali

II. siddapura

III. 75°28' East, 14°4' North.

IV. (a) Maidan feature, sparse vegetation.

(b) 1 Km north-west of Hatur.

(c) Red soil, granite.

V. (F) Megalithic - burials

VI. Disturbed pit burials with 1 - 1.2 m dia and 1.7 m deep, in an area of 200 m circumference.

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No. 28

I. Honnali

II. Chinnukatte

III. 75°30' East, 14°8' North.

IV. (a) Maidan feature, sparse vegetation.

(b) 0.25 Km away towards south of village on the east side of Lakkanakoppa road.

(c) Red soil, granite.

V. (F) Megalithic - stone circles.

VI. About 20 circles of varying dimension in an area of 200 m east-west x 11 m north-south.

No. 29

I. Bhadravathi

II. Nimbegondi, 28 Km north-east of Shimoga town.

III. 75°44' East, 14°5' North.

IV. (a) Maidan features. Scanty vegetation. Greyish soil.

(b) About 20 m from the river bank.

(c) Greyish soil, Gneiss.

V. (D) Mesolithic - Non-geometric scrapers, point, etc made on quartz.

(E) Neolithic - Brown and Black ware, Burnished Blackish Grey ware and stone axe. White painted Black and Red ware.

(F) Megalithic - Black and Red ware.

No 30

I. Bhadravathi

II. Vaderpura;, 10 Km south-east of Honnali

III. 75°44'30" East, 14°4" North.

IV. (a) Maidan feature, scanty vegetation, gravel bed and schist outcrops.

(b) 20 m away from the right bank near a meander.

(c) Reddish silt, gravel, schist.

V. (A) Lower Palaeolithic - Hand axes, scrapers.

(D) Mesolithic - Points, Bladish falkes - non-geometric.

(E) Neolithic - Burnished Grey ware spout.

(F) Megalithic - Black and Red ware.

VI. (A) 40 m east-west x 70 m north-south.

(D) From the slopes of the river section.

(E) and (F) - Disturbed sites.

No. 31

I. Bhadravathi

II. Anaveri, 20 Km north-east of Shimoga town.

III. 75°14'30" East, 14°3'30" North.

VI. (a) Maidan features. Scanty vegetation, Greyish soil.

(b) West of the village, 50 m from the river bank.

(c) Reddish silt, schist.

V. (D) Mesolithic - Bladish flakes, points, cores, non-geometric group made on quartz.

(E) Neolithic - Burnished Grey ware, Ground stone tools collected from the site are exhibited in the local School.

(F) Megalithic - Black and Red ware.

VI. 3 acres, totally damaged.

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No. 32

I. Bhadravathi

II. Nagasamudra. 19 Km north-east of Shimoga town.

III. 75°42' East, 14°2'30" North.

IV. (a) Maidan feature. Scanty vegetation. Reddish soil.
(b) Largest pebble gravel bed in this stretch of the river.
(c) Reddish silt, schist.

V. (A) Lower Palaeolithic - Hand axes/flakes.
(E) Neolithic - Blackish Grey ware, Ground stone axes.
(F) Megalithic - All Black ware.

VI. (A) Largest gravel bed.
(E) Disturbed site.

No. 33

I. Hosanagara

II. Sudur, 10 Km west of Ayanur

III. 75°21'15" East, 14°45" North.

IV. (a) Malnad feature. Thick forest area. Brown soil.
(b) Beyond the village limit.
(c) Brown silt, Gravel, Granite.

V. (A) Lower Palaeolithic - Chopper- hand axes made on quartz pebbles.

VI. The tools exhibit thin coat of brownish patina.
15 m east-west x 30 m north-south.

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No. 34

I. Hosanagara

II. Nilaskal, about 6 Km west of Nagara town.

III. 75°30' East, 13°47'15" North

IV. (a) Malnad feature, thick forest, granite outcrops, Brownish soil.

(b) 0.2 Km west of the village.

(c) Brown soil, granite.

V. (D) Mesolithic - Bladish flakes, irregular flakes of quartz.

(E) Neolithic - Light Brown Blotchy Grey ware.

(F) Megalithic - Menhirs in groups (35 nos.).

VI. (D) Sparsely scattered in about one acre area.

(E) Neolithic appendage noticed by Sundara in 1974.

(F) Largest in Southern Karnataka - 10 acre area.

No. 35

I. Sakrepatna

II. Lakya, 18 Km north-east of Chickmagalur.

III. 75°51' East, 13°21' North.

IV. (a) Semi-Malnad feature, thick patch of vegetation, Brown soil, sand stone and quartz outcrops.

(b) Near the main road.

(c) Red soil, sand stone?

V. (A) Lower Palaeolithic - Hand axes made on milky quartz.

VI. Quartz lumps are found strewn on the slopes of the nearby hillock.

60 m east-west x 30 m north-south.

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No. 36

I. Sakrepatna

II. Agrahara, 6 Km south-east of Sakrepatna.

III. 75°57' East, 13°26' North.

IV. (a) Maidan feature, sparse vegetation, Brown soil.

(b) 0.5 Km north of the village.

(c) Brown sandy silt. Gravel bed rock.

V. (A) Lower Palaeolithic - Hand axes, made on milky quartz.

VI. Loose gravel bed, near the over-bridge measure 5 m east-west x 30 m north-south.

No. 37

I. Sakrepatna

II. Nidaghatta

III. 76°3' East, 13°2'30" North

IV. (a) Maidan feature, sparse vegetation, Brown soil, Pebbles.

(b) 1.5 Km north of the village.

(c) Brown silt, thin gravel.

V. (A) Lower Palaeolithic - Choppers, Hand axes, discoids, scrapers, made on quartz and quartzite.

VI. In 1881, Bruce Foote collected pebble tools here. 60 m east-west x 30 m north-south.

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No. 38

I. Kadur

II. Kadur

III. 76°00'38" East, 13°33'13" North

IV. (a) Maidan feature, sparse vegetation. Brown soil.

(b) 200 m south of Traveller's Bungalow.

(c) Brown soil, gravel, granite.

V. (D) Mesolithic - few scrapers, Bladish flakes made on quartz.

VI. Bruce Foote reported Palaeolithic site in 1881.

30 sq.m area.

No. 39

I. Tarikere

II. Kenchapura, 8 Km west of Lingadahalli.

III. 75°50' East, 13°38'30' North

IV. (a) Maidan feature, sparse vegetation, brown soil, quartzite outcrops.

(b) Outskirts of the village on the Lingadahalli-Tarikere road.

(c) Brown soil, Sand stone.

V. (F) Megalithic - A huge Menhir of sand stone.

VI. It leans towards east and quartz lumps are found packed at the bottom.

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No. 40

I. Kadur

II. Gedlahalli

III. 76°4' East, 13°31' North

IV. (a) Maidan features, sparse vegetation.

(b) 6 Km south-west of Kadur.

(c) Granite, gravel (quartzite and quartz), Brownish soil, whitish fine sand.

V. (A) Choppers, hand axes, discoids, scrapers, points made on quartzite.

VI. A small stream seem to have existed discharging into the lake about 2 Km towards west. Tools are found embedded in the gravel over the gravel bed and in the sections of the pits.

(2) THE BHADRA VALLEY (SHIMOGA AND CHIKMAGALUR DISTRICTS)

No. 1

I. Bhadravathi

II. Barandur, 8 Km south of Bhadravathi town.

III. 75°43' East, 13°47' North.

IV. (a) Maidan features, sparse vegetation. Reddish soil.

(b) To the west of the village.

(c) Reddish-silt, gravel, schist.

V. (A) Lower Palaeolithic - chopper, hand axe made on quartzite.

VI. Loose gravel patches yield tools.

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No. 2

I. Bhadravathi

II. Dodgopenahalli, 5 Km south of Bhadravathi.

III. 75°42' East, 13°47'30" North.

IV. (a) Maidan features, sparse vegetation, Reddish soil.

(b) 1.5 Km west of the village.

(c) Reddish silt, gravel, schist.

V. (A) Lower Paleolithic - Chopper, hand axe made on quartzite.

VI. Loose gravel patch
20 m east-west x 60 m north-south.

No. 3

I. Tarikere

II. Sidhlipura, 14 Km south of Bhadravathi town.

III. 75°41'30" East, 13°46' North.

IV. (a) Maidan features, sparse vegetation, Reddish soil.

(b) 1 Km south-west of the village.

(c) Reddish silt, gravel, schist.

V. (A) Lower Palaeolithic - Chopper, hand axe made on quartzite.

VI. Small gravel patches in an area of
20 m east-west x 100 m north-south.

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No. 4

I. Bhadravathi

II. Shankaraghatta, 4 Km north-east of Lakkavalli.

III. 75°58'30" East, 13°44' North

IV. (a) Semi-Malnad, patches of thick vegetation, Reddish soil. Milky quartz outcrops.

(b) 0.5 Km south of the village (Shankaramatti).

(c) Reddish silt, gravel, schist (?)

V. (A) Lower Palaeolithic - Hand axe made on quartzite.

VI. Tools occur in the dry bed of a small nullah.

No. 5

I. Tarikere

II. Somapura, 8 Km north of Lakkavalli.

III. 75°41' East, 13°43'30" North.

IV. (a) Malnad features. Thick forest, dark brown soil, granite outcrops.

(b) 2.5 Km north of Khandya.

(c) Whitish sandy silt, gravel, granite.

V. (A) Lower Palaeolithic - Hand axes, scrapers of quartzite.

VI. From loose gravel bed of a nullah,

20 m east-west x 10 m north-south.

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No. 6

I. Chickmagalur

II. Balehonnur, 40 Km south of Narasimharajapura.

III. 75°28'30" East, 13°21' North.

IV. (a) Malnad features. Thick vegetation, dark brown soil.

(b) 1 Km south-east of the town.

(c) Reddish silt, gravel, granite.

V. (A) Lower Palaeolithic - Hand axes made on quartzite.

VI. Loose gravel bed, measures
70 m east-west x 70 m north-south.

No. 7

I. Narasimharajapura

II. Khandya

III. 75°31'30" East, 13°22'30" North.

IV. (a) Malnad features. Thick forest, dark brown soil, granite outcrops.

(b) 2.5 Km north of Khandya.

(c) Whitish sandy silt, gravel, granite.

V. (A) Lower Palaeolithic - Hand axes, scrapers of quartzite.

VI. From loose gravel bed of a nullah, a tributary of Bhadra.
20 m east-west x 10 m north-south.

No. 8

I. Kalasa

II. Kagganahalla, 8 Km upstream of Mahagondi.

III. 75°26'30" East, 13°16' North.

IV. (a) Malnad features. Thick forest, rich fauna, dark brown soil.

(b) It is situated near a Coffee Estate.

(c) Whitish sandy silt, gravel granite.

V. (A) Lower Palaeolithic - Choppers, hand axe of trap rock/Horne blend schist (?)

VI. Loose gravel bed.
15 m east-west x 80 m north-south.

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No. 9

I. Bhadravathi

II. Mattighatta, 14 Km north of Bhadravathi.

III. 75°41'30" East, 13°56'30" North.

IV. (a) Maidan feature, sparse vegetation, greyish soil.

(b) 0.5 Km east of the village.

(c) Grey soil, Granite.

V. (D) Mesolithic - Non-geometric points, scrapers made on quartz.

(E) Neolithic - Terracotta cylindrical bead.

VI. 100 m east-west x 150 m north-south, disturbed.

No. 10

I. Bhadravathi

II. Malenahalli, 8 Km south of Holehonnur.

III. 75°42' East, 13°56'30" North.

IV. (a) Maidan feature, sparse vegetation, reddish soil.

(b) 1 Km north-east of the village.

(c) Red silt, granite.

V. (D) Mesolithic - Bladish flakes, scrapers, points of non-geometric group made on quartz.

VI. Tools found embedded in Reddish soil capping the granite hillock.

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No. 11

I. Bhadravathi

II. Holebelgal, 5 Km south of Holehonnur.

III. 75°47'30" East, 13°58' North.

IV. (a) Maidan feature, sparse vegetation, greyish sandy soil.

(b) 2 Km south of the village.

(c) Grey soil, Granite.

V. (D) Mesolithic - Non-geometric group with points, scrapers, etc, made on quartz.

VI. 50 Sq.m area, under cultivation.

No. 12

I. Bhadravathi

II. Dasarakalhalli, 12 Km north of Bhadravathi

III. 75°43' East, 13°57'30" North.

IV. (a) Maidan feature, sparse vegetation, Grey soil, Granite outcrops, small river borne pebbles.

(b) 0.2 Km west of the village.

(c) Grey soil, granite.

V. (D) Mesolithic - Scrapers, points of non-geometric group made on quartz.

VI. 30 m east-west x 50 m north-south. Tools are found on th slopes of the granite outcrops.

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No. 13

I. Bhadravathi

II. Kagekodumagge, 7 Km north of Bhadravathı town.

III. 75°42'30" East, 13°54' North.

IV. (a) Maıdan feature, sparse vegetatıon, Grey soıl, Granıte outcrops.

(b) 1 Km north-east of the vıllage.

(c) Grey soıl, granıte.

V. (D) Mesolıthıc - Scrapers, bladısh flakes, poınts made on quartz; non-geometrıc group.

VI. Tools are found embedded ın the sandy patches on the slopes of Granıte outcrops.

No. 14

I. Bhadravathı

II. Bommankatte, 5 Km south of Bhadravathı town.

III. 75°41' East, 13°48' North.

IV. (a) Maıdan feature, sparse vegetatıon, grey soıl, granıte outcrops.

(b) 0.5 Km south-west of the vıllage.

(c) Grey soıl, granıte.

V. (D) Mesolıthıc - Non-geometrıc poınts, scrapers made on quartz.

VI. 40 m east-west x 100 m north-south.
Small pebbles notıced ın the vıcınıty of the sıte.

No. 15

I. Bhadravathi

II. Gondi, 10 Km south of Bhadravathi.

III. 75°41' East, 13°45' North.

IV. (a) Semi-Malnad feature. Slopes of hillocks covered with vegetation. Reddish soil, ancient gold mines in the vicinity.

V. (D) Mesolithic - Scrapers, points made on quartz; non-geometric.

VI. Tools are found on the peak of the hillock at 798 m height.

(3) THE TUNGA VALLEY (SHIMOGA DISTRICT)

No. 1

I. Shimoga

II. Hoisanahalli, 5 Km north-east of Shimoga town.

III. 75°38'30" East, 14°47'30" North.

IV. (a) Maidan features, scanty vegetation, reddish soil.

(b) Pebble patch in the river bed.

(c) Reddish silt, gravel schist.

V. (B) Middle Palaeolithic - Scrapers, points, made on quartz flakes of medium size.

VI. 20 m east-west x 25 m north-south area, gravel bed with medium to small pebbles.

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No. 2

I. Shimoga

II. Abbaragatte, 11 Km east of Shimoga town.

III. 75°39'30" East, 14°46'30" North.

IV. (a) Maidan features, scanty vegetation, Reddish soil.
(b) 40 m east of the river bank.
(c) Reddish silt, schist.

V. (D) Mesolithic - Points, bladish flakes, etc made on quartz.
(E) Neolithic - Black and Brown ware, Lug handle, sling balls, polished chips.
(F) Megalithic - Black ware and Grey ware.

VI. (D) Found mixed with Neolithic material.
(E) and (F) Mound is disturbed.

No. 3

I. Shimoga

II. Pilangere, 6 Km east of Shimoga town.

III. 75°38' East, 13°57'30" North.

IV. (a) Maidan feature, sparse vegetation, Granite hillock, Reddish soil.
(b) In the gravel bed and on the slopes of hillock.
(c) Reddish silt, Gneiss.

V. (A) Lower Palaeolithic - Choppers, hand axes, discoids on quartzite.
(D) Mesolithic - Points, bladish flakes, etc made on quartz.
(E) Neolithic - Burnished Pinkish Grey ware, Ground axes.
(F) Megalithic - Black and Red ware, All Black ware.

VI. (D) Site disturbed.
(E) Found sparsely.

No. 4

I. Shimoga

II. Holebenavalli, 4.5 Km east of Shimoga town.

III. 75°37'15" East, 13°56'30" North.

IV. (a) Maidan feature, scanty vegetation, Greyish soil.

(b) 15 m away from the river bank.

(c) Greyish silt, Gneiss.

V. (E) Neolithic - Micaceous Dull Grey ware, White painted Black and Red ware.

(F) Megalithic - Black and Red ware.

VI. (E) Mound totally disturbed.

No. 5

I. Shimoga

II. Sulebailu, 5 Km east of Shimoga

III. 75°54' East, 14°34' North

IV. (a) Maidan features, scanty vegetation. Reddish soil. Granite hillock.

(b) On the slopes of the hillock.

(c) Reddish silt, Gravel Gneiss.

V. (D) Mesolithic - Points, scrapers made on quartz.

(E) Neolithic - Burnished Grey ware.

(F) Megalithic - Menhir of Granite, 3 m height.

VI. (D) In the vicinity of Megalithic site.

(E) Ancient site, totally disturbed.

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No. 6

I. Shimoga

II. Arakere, 4 Km south of Shimoga town.

III. 75°33'30" East, 13°50' North.

IV. (a) Maidan features, sparse vegetation. Reddish soil.

(b) Gravel bed in the section.

(c) Reddish silt, Gravel Gneiss.

V. (B) Middle Palaeolithic - Scrapers, points made on core, medium size pebbles of quartz.

VI. Loose gravel bed; 50 Sq.m area.

No. 7

I. Shimoga

II. Honnapura, 8 Km south of Shimoga town.

III. 75°30'3" East, 13°43'30" North.

IV. (a) Maidan features, sparse vegetation. Reddish soil.

(b) Loose and cemented gravel bed in the river bed.

(c) Reddish silt. Cemented pebble gravel, granite.

V. (A) Lower Palaeolithic - Hand axes, cleaver, flakes on quartzite.

VI. By far, the largest gravel-bed in the valley measuring 100 m east-west x 400 m north-south.

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No. 8

I. Shimoga

II. Mandagadde, 35 Km south of Shimoga town.

III. 75°22'30" East, 13°43'30" North.

IV. (a) Semi-Malnad features with patches of thick vegetation. Darkish Grey soil.

(b) 1 Km south-east of the village.

(c) Reddish silt, Gneiss.

V. (D) Mesolithic - Points, Scrapers, etc. made on Quartz and rock Crystal.

VI. Found embedded in the rain gully section.

No. 9

I. Shimoga

II. Jambavalli, 42 Km south of Shimoga town.

III. 75°24'30" East, 13°42'30" North.

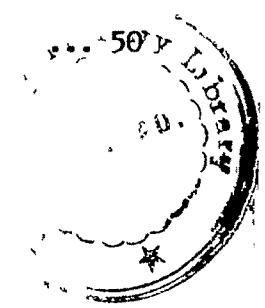
IV. (a) Semi-Malnad features, thick patches of forests, Reddish soil.

(b) 2 Km east of the village near the river bank.

(c) Reddish Silt, Gneiss.

V. (F) Megalithic - Menhir of Granite.

VI. Solitary.



No. 10

I. Tirthahalli

II. Sirgala, 15 Km north of Tirthahalli town.

III. 75°20'30" East, 13°42' 30" North.

IV. (a) Semi-Malnad features,thick patches of vegetation, grass patches, Laterite.

(b) Near the river bank.

(c) Reddish silt, laterite, Gneiss.

V. (D) Mesolithic - Scrapers, points made on quartz.

VI. 20 Sq.m circumference.

No. 11

I. Tirthahalli

II. Tirthahalli.

III. 75°15' East, 13°41'30" North.

IV. (a) Semi-Malnad features. Near the site sparse vegetation. Hillock, Darkish Grey soil.

(b) 0.5 Km south-west of the town-ship.

(c) Grey soil, granite.

V. (D) Mesolithic - Points, scrapers, cores, etc made on quartz and rock-crystal.

VI. 150 m circumference at 270 m MSL.

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No. 12

I. Tirthahalli

II. Taluve, 4 Km south-west of Tirthahalli.

III. 75°17' East, 13°39'30" North.

IV. (a) Malnad features with thick forest. Greyish soil. Low granite hillock.

(b) 0.25 Km south-west of the village.

(c) Grey soil.

V. (D) Mesolithic - Points, scrapers of non-geometric group made on quartz.

VI. Scattered in 100 m circumference near the granite outcrop.

No. 13

I. Tirthahalli

II. Tirthamattur, 15 Km south-west of Tirthahalli town.

III. 75°20'30' East, 13°37' North.

IV. (a) Malnad features with thick vegetation. Brownish soil. Granite outcrop.

(b) 0.3 Km from the river bank.

(c) Brown silt, granite.

V. (D) Mesolithic - Bladish flakes, scrapers, points made on quartz.

VI. 200 m circumference, near the granite outcrop.

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No. 14

I. Tırthahallı

II. Nadbur, 4 Km south of Kammaradı

III. 75°12' East, 13°34'30" North.

IV. (a) Malnad features with thıck vegetation. Brownısh soıl, Granıte outcrop.

(b) 1 Km west on the left bank of the rıver Malatı.

(c) Brown sılt, granıte.

V. (D) Mesolıthıc - Points, scrapers, flakes of non-geometrıc group made on quartz.

VI. Tools are found embedded ın the humus soıl cappıng the granıte outcrops ın an area of 200 Sq.m.

CHICKMAGALUR DISTRICT

No. 15

I. Srıngerı

II. Srıngerı

III. 75°15'30" East, 13°24'30" North.

IV. (a) Malnad features wıth thıck vegetatıon. Reddısh soıl, Granıte hıllock.

(b) 1 Km from rıver bank towards north.

(c) Brownısh sılt, granıte.

V. (D) Mesolıthıc - Scraper, poınts, flakes of non-geometrıc group made on quartz and rock crystal.

VI. Tools are found embedded ın the reddısh humus cappıng the granıte outcrops.

50 m east-west x 25 m north-south.

No. 16

I. Sringeri

II. Hosagadde, 15 Km west of Sringeri town.

III. 75°9'30" East, 15°31' North.

IV. (a) Malnad features, thick vegetation, heavy rain falling area. Brownish soil, Granite outcrops.

(b) 300 m north-east of the village.

(c) Brown soil, granite.

V. (D) Mesolithic - Non-geometric tools represented by points, scrapers, etc.

VI. Found embedded in the reddish earth capping granite outcrop site measuring 70 m east-west x 60 m north-south.

No. 17

I. Koppa

II. Hariharapura

III. 75°18'30" East, 13°31'North.

IV. (a) Malnad features, thick vegetation. Brownish Grey soil.

(b) 1 Km from the town, near the bridge.

(c) Brownish soil, Granite.

V. (A) Lower Palaeolithic - Hand axe made on quartzite.

VI. Oyster shell is found in the gravel bed, measuring 25 m east-west x 150 m north-south.

(4) THE HEMAVATI VALLEY (CHIKMAGALUR AND HASSAN DISTRICTS)

No. 1

I. Mudigere

II. Bankal, 10 Km from the source of the river.

III. 75°32' East, 13°7'30" North.

IV. (a) Maidan features, thick forests, brownish soil.

(b) 1.5 km to the west of the village.

(c) Brown soil, granite?

V. (A) Lower Palaeolithic - Choppers, hand axes made on quartz containing grains of white mica.

VI. Narrow pebble bed spread in an area of 50 Sq. m.

No. 2

I. Holenarsipur

II. Kattebelguli, 9 Km west of Holenarsipur.

III. 76°11' East, 12°49' North.

IV. (a) Semi-malnad, patches of forests, gneiss outcrops, brown soil.

(b) 50 m east of the river across Hemavati.

(c) Silt. Kankary cemented gravel, clay? Gravel, gneiss.

V. (A) Lower Palaeolithic - Hand axes.

(B) Middle Palaeolithic - Scrapers, points, etc., all made on magnetite quartzite.

(D) Mesolithic - Scrapers, flakes, etc on quartz.

VI. The site accommodates a regular section. Tools are in mint mint condition. Spread on the slopes of the section.

5 m east-west x 2 m north-south.

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No. 3

I. Holenarasipur

II. Kattehosalli, 11 Km north-east of Holenarasipur.

III. 78°18' East, 12°49' North.

IV. (a) Semi-Malnad, patches of thick forests, Brown soil.

(b) 0.2 Km from the village.

(c) Brown silt, cemented gravel bed, Gneiss.

V. (B) Middle Palaeolithic - Scrapers, points, etc made on quartz.

(D) Mesolithic, Points, scrapers, flakes, etc made on quartz.

VI. Tools are found on the slopes of the section.

No. 4

I. Channarayapatna

II. Cholenahalli, 12 Km north-east of Holenarsipur.

III. 78°18'30" East, 12°49'30" North.

IV. (a) Semi-Malnad features, sparse vegetation, Brown soil.

(b) Away from the village near the river bank.

(c) Brown silt, cemented gravel bed, Gneiss.

V. (B) Middle Palaeolithic - Scrapers, points made on magnetite, quartz.

(D) Mesolithic - Scrapers, points, flakes on quartz.

VI. Found on the slopes of the river section.

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No. 5

I. Holenarsipur

II. Mudalahippe, 6 Km north-east of Holenarsipur.

III. 76°18' East, 12°49'30" North.

IV. (a) Maidan feature, scanty vegetation, Brown soil.

(b) 1 Km north-east of the village.

(c) Brown silt, Gneiss.

V. (D) Mesolithic - Points, scrapers, non-geometric group made on quartz.

VI. Tools are found in 30 Sq.m area.

No. 6

I. Holenarsipur

II. Maranayakanahalli, 18 Km east of Holenarsipur.

III. 76°20'15" East, 12°47'30" North.

IV. (a) Maidan features, scanty vegetation. Brown soil.

(b) 1 Km east of the village.

(c) Brown silt, gravel, schist.

V. (D) Mesolithic - Scrapers, points, Bladish flakes of non-geometric group made on quartz.

VI. On the slopes of the section; 50 m circumference.

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No. 7

I. Hassan

II. Pratapakumarıgrama (Karıgowdana Koppalu)

III. 76°7' East, 12°50' North.

IV. (a) Maıdan features, sparse vegetatıon. Reddısh soıl, Granıte outcrops.

(b) 2.5 Km from the rıght bank of the rıver Hemavatı.

(c) Reddısh soıl, Granıte.

V. (F) Megalıthıc - Two menhırs of granıte.

VI. Quartz lumps are found scattered around menhırs.

No. 8

I. Holenarsıpur

II. Mulekalenahallı, 13 Km north-east of Holenarsıpur.

III. 76°22' East, 12°49'30" North.

IV. (a) Maıdan features, scanty vegetatıon, Reddısh soıl.

(b) West of the vıllage.

(c) Reddısh soıl, Granıte.

V. (F) Megalıthıc - Solıtary menhır of granıte.

VI. It has conıcal top, smooth surface. Quartz lumps found scattered around the menhır.

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(5) TRIBUTARIES OF THE HEMAVATI VALLEY (HASSAN DISTRICT)

No. 1

I. Arsikere

II. Halekalgudda, 2 Km north-east of Arsikere town.

III.

IV. (a) Maidan features, sparse vegetation. Greyish soil. Granite hillocks.

(b) On the slopes of the foothill.

(c) Grey soil, granite.

V. (D) Mesolithic - Few scrapers, points, flakes made on quartz.

(F) Megalithic - Couple of menhirs of granite.

VI. (D) 100 m east-west x 150 m north-south.

(F) Menhirs are triangular in shape. Quartz lumps are found scattered.

No. 2

I. Channarayapatna

II. Settihalli, 3 Km east of Channarayapatna.

III.

IV. (a) Maidan features, sparse vegetation. Brown soil. Granite outcrops.

(b) 0.5 Km west of the village in a field.

(c) Brown soil, granite.

V. (D) Mesolithic - Scrapers, points, etc. made on quartz.

VI. Found in about 60 Sq. m area under cultivation.

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No. 3

I. Arsikere

II. Chettanahalli, 8 Km west of Harnahalli.

III. 76°9' East, 13°11' North

IV. (a) Semi-Maidan features; semi-deciduous forests, Reddish soil, laterite blocks.

(b) Outskirts of the village near the Harnahalli-Hassan road.

(c) Red soil, laterite.

V. (D) Mesolithic - Points, scrapers, etc made on quartz.

VI. Noticed in a small nullah
20 m east-west x 25 m north-south.

No. 4

I. Hassan

II. Pungame, 23 Km of Hassan.

III. 76°9' East, 13°5' North

IV. (a) Maidan features, sparse vegetation, Red soil, Granite outcrops.

(b) 0.2 Km west of the village.

(c) Red soil, granite.

V. (F) Megalithic - Stone circles.

VI. This is reported in 1956. Menhirs were also noticed. However, they are missing. Site is heavily disturbed. 10 acre area.

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No. 5

I. Hassan

II. Kondajji

III. 76°7' East, 13°14' North

IV. (a) Maidan feature, sparse vegetation, Red soil.

(b) 0.2 Km south-west of the Varadarajaswamy temple.

(c) Red soil, Granite.

V. Megalithic - Stone circles.

VI. In 1956, 24 stone circles were reported. But now only 5 - 6 circles survive and are being disturbed.

No. 6

I. Hassan

II. Honnavara

III. 76°10' East, 13°6' North

IV. (a) Maidan features, sparse vegetation. Red soil. Haematite boulders.

(b) 200 m west of the village.

(c) Red soil, Bed rock.

V. (F) Megalithic - Stone circles.

VI. All circles disturbed due to agricultural activity. 2 acre area.

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(6) THE UPPER KAVERI VALLEY (HASSAN DISTRICT)

No. 1

I. Arkalgud

II. Kuduvinahosahalli, 6.5 Km west of Konanur town.

III. 76°15" East, 12°34'30" North.

IV. (a) Semi-malnad. Small patches of thick forest. Reddish soil, haematite boulders, quartz lumps.

(b) 0.5 Km north of the village.

(c) Reddish soil, granite.

V. (F) Megalithic - Dolmens with stone circles.

VI. Situated in two locations. 150 m distance; disturbed.

No. 2

I. Arkalgud

II. Shigodu, 5.5 Km west of Konanur town.

III. 76°1'30" East, 12°36' North.

IV. (a) Semi-malnad. Patches of thick vegetation. Haematite boulders and granite outcrops. Reddish soil.

(b) 0.5 Km north of the village.

(c) Red soil, granite.

V. (F) Megalithic - Cairn stone circles and barrows. Haematite granite material.

VI. Similar to the ones reported from Sompura and Managondanahalli. 20 acres, disturbed. Found in 4 localities.

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No. 3

I. Arkalgud

II. Ullenahalli

III. 76°2'30" East, 12°37'30" North.

IV. (a) Semi-Malnad. Patches of thick vegetation. Red soil. Granite outcrops.

(b) 2 Km north of the village.

(c) Red soil, Granite.

V. (F) Megalithic - Two dolemns of granite with stone circle.

VI. Disturbed. Being re-used as small shrines.

No. 4

I. Arkalgud

II. Konanur, 1.5 Km south-east of the town.

III. 76°3'30" East, 12°38' North.

IV. (a) Semi-Malnad, patches of thick vegetation. Brownish soil, Granite outcrops.

(b) Near the medieval bridge.

(c) Brownish silt, Granite.

V. (A) Lower Palaeolithic - Hand axes on Quartzite.

VI. Gravel patches between Granite boulders in the river bed.

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No. 5

I. Arkalgud

II. Hosallı, 2 Km south of Ramanathapura town.

III. 76°3'45" East, 12°36'36" North.

IV. (a) Maıdan features, sparse vegetatıon. Red soıl, granıte outcrops.

(b) 2 Km from the rıver on the rıght bank.

(c) Red soıl, granıte.

V. Megalıthic - Menhırs of granıte.

VI. Sıtuated between 100 m dıstance. One of the menhırs also reused for ınscrıbıng an Epıgraph durıng medıeval perıod.

No. 6

I. Arkalgud

II. Rudrapatna, 10 Km west R.N. Pura.

III. 76°7'30" East, 12°36' North.

IV. (a) Maıdan feature, sparse vegetatıon, brown soıl.

(b) 1 Km north of the vıllage.

(c) Brown sılt, loose gravel, granıte?

V. (A) Lower Palaeolıthıc - Choppers, hand axes, scrapers made on quartzıte and brown jasper.

VI. By far, the largest pebble bed ın the upper reaches of Kaverı measuring 1 Km east-west x 0.3 km north-south.

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No. 7

I. Arkalgud

II. Sompura, 9 Km from R.N. Pura.

III. 76°7' East, 12°33'30" North.

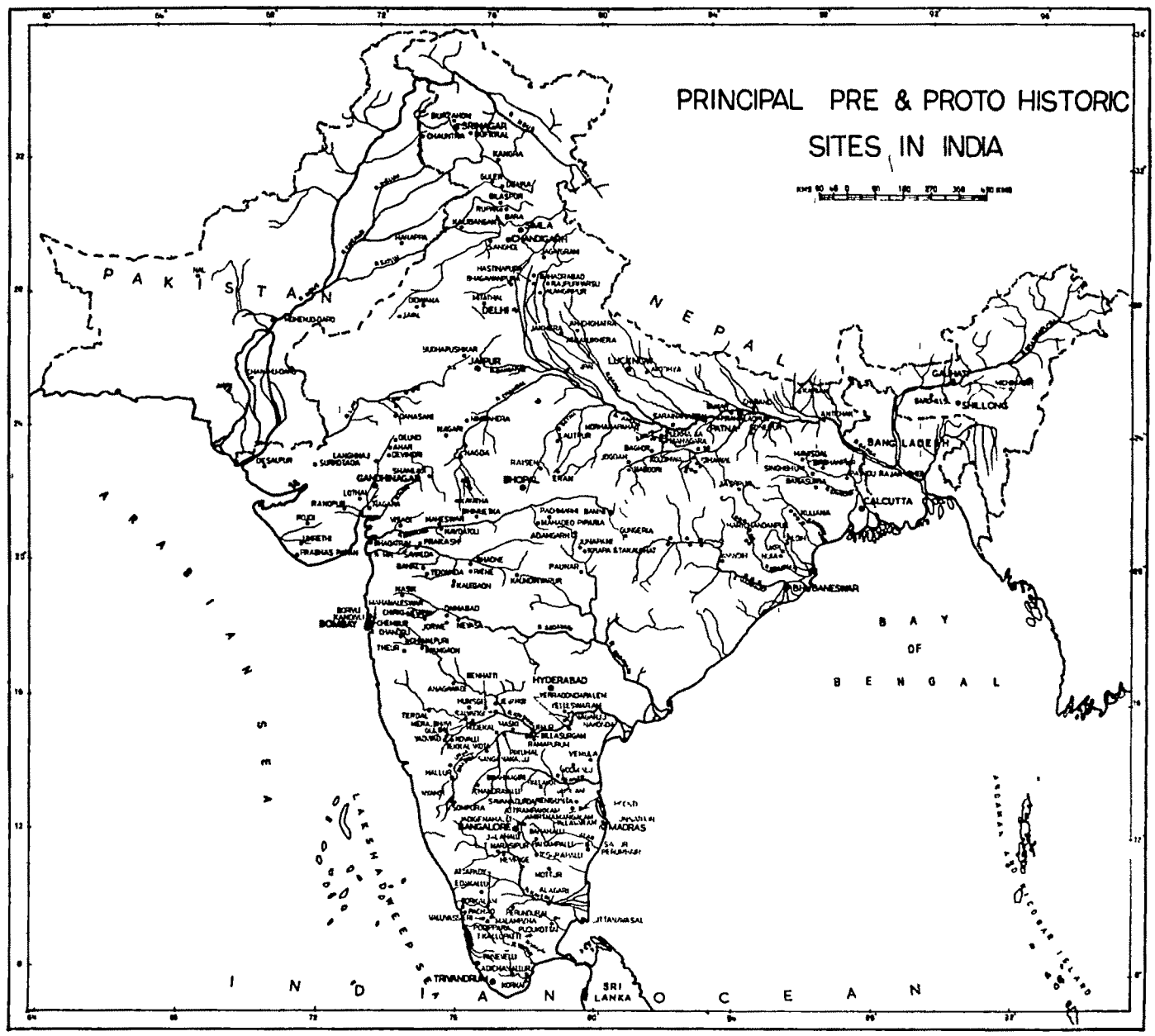
IV. (a) Maidan feature, scanty vegetation. Red Soil. Granite outcrop. Quartz lumps.

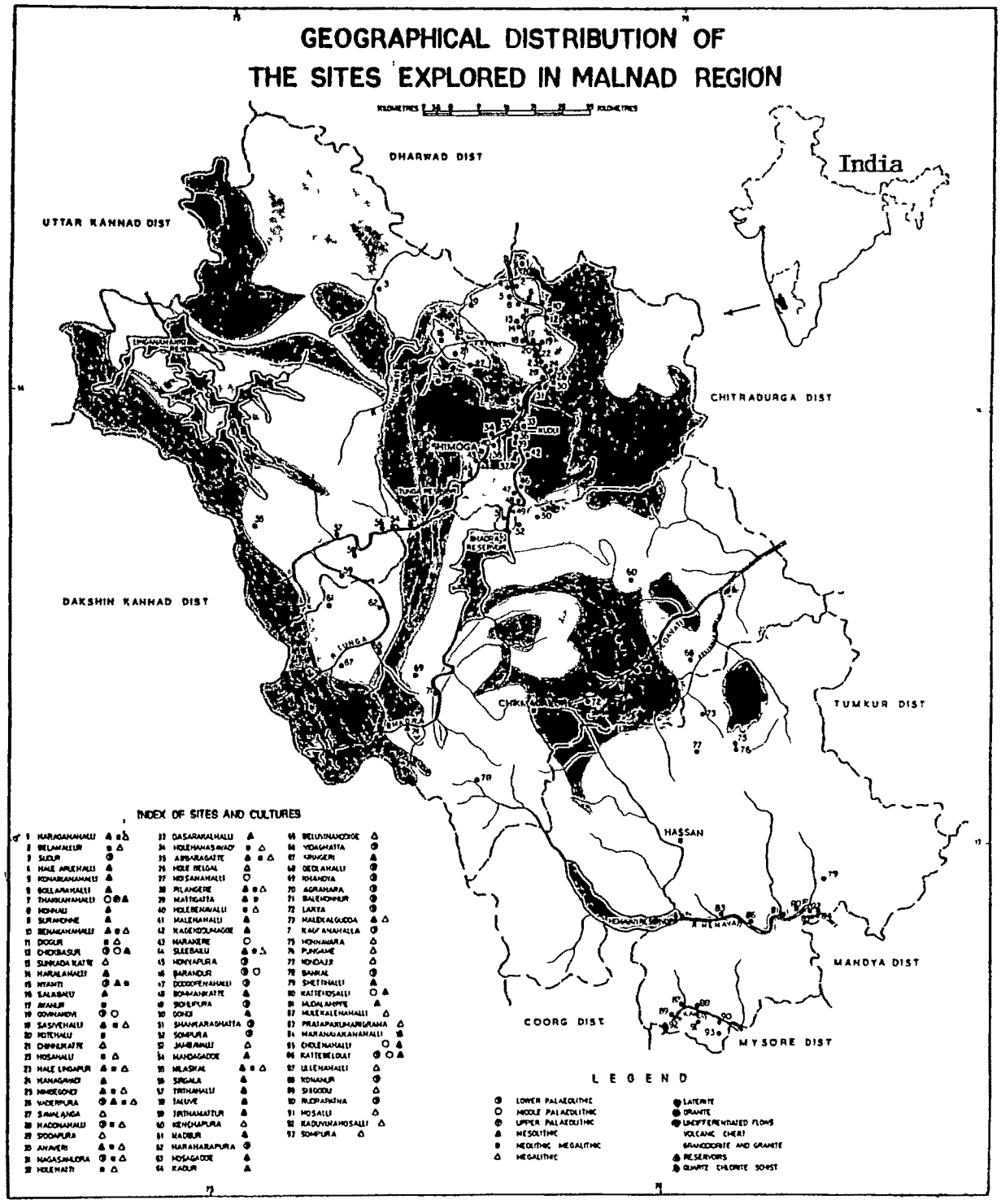
(b) 1 Km west of the village.

(c) Red soil, Granite.

V. (F) Megalithic - Pit burials and cairns.

VI. Twelve burials of various dimensions scattered in an area of 2 acres.


PRINCIPAL PRE & PROTO HISTORIC
SITES IN INDIA
PAKISTAN
NEPAL
BAY
OF
BENGAL
ARABIAN SEA
INDIAN OCEAN
SRI LANKA
LAKSHADWEEP
ANDAMAN AND NICOBAR ISLAND
DELHI
JAIPUR
LUCKNOW
PATNA
CALCUTTA
BHOPAL
HYDERABAD
BANGALORE
MADRAS
BOMBAY
TRIVANDRUM
BHUBANESWAR
GUWAHATI
SHILLONG
BANGLADESH


GEOGRAPHICAL DISTRIBUTION OF
THE SITES EXPLORED IN MALNAD REGION
KILOMETRES
DHARWAD DIST
UTTAR KANNAD DIST
India
CHITRADURGA DIST
SHIMOGA
TUNGA
BHADRA RESERVOIR
DAKSHIN KANNAD DIST
CHIKMAGALUR
TUMKUR DIST
HASSAN
HEMAVATHI
MANDYA DIST
COORG DIST
MYSORE DIST
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1 HARAGANAHALLI
2 BELAMALLUR
3 SUDUR
4 HALE ARLEHALLI
5 KONAKANAMALLI
6 BOLLAPANAHALLI
7 THARIKANAHALLI
8 KONNALI
9 SURAKONKE
10 BENAKANAHALLI
11 DODDUR
12 CHICKBASUR
13 SUNKADA KATTE
14 HARALAHALLI
15 NYANTI
16 SALABALU
17 AVANUR
18 GOVINAKOVI
19 SASIVEHALLI
20 KOTEHALLI
21 CHIPPALKATTE
22 HOSAHALLI
23 HALE LINGAPUR
24 KANAGANAKI
25 KINNEGOKI
26 VADERPURA
27 SAMALANGA
28 KACCHANAHALLI
29 SIDDAPURA
30 ANAVERI
31 NAGASAMUDRA
32 HOLENARSI
33 DASARAKALHALLI
34 HOLEHANASAVADI
35 AMBARAGATTE
36 HOLE BELGAL
37 HOSAHANAMALLI
38 PILANGERE
39 MATTIGATTA
40 HOLEBENAVALLI
41 MALENAHALLI
42 KALEKOLLAMAGGE
43 MARAKERE
44 SILEBALLI
45 HONNAPURA
46 BARANDUR
47 DODDOPENAHALLI
48 BOMMANKATTE
49 SIDHIPURA
50 GONDI
51 SHAMARASHATTA
52 SOMPURA
53 JAMBANALLI
54 MANDAGADDE
55 HILASKAL
56 SINGALA
57 TIRTHAHALLI
58 TALUVE
59 TIRTHAMATTUR
60 KENCHAPURA
61 MADBUR
62 HARAHARAPURA
63 HOSAGADDE
64 KADUR
65 BELLUVINAKODIGE
66 YEDAGHATTA
67 KINAGERI
68 DEGLAHALLI
69 KOHADYA
70 AGRAHARA
71 BALEHONNUR
72 LAKYA
73 MALENALGUDDA
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UPPER PALAEOLITHIC
MESOLITHIC
NEOLITHIC MEGALITHIC
MEGALITHIC
LATERITE
GRANITE
UNDIFFERENTIATED FLOWS
VOLCANIC CHERT
GRANODIORITE AND GRANITE
RESERVOIRS
QUARTZ CHLORITE SCHIST

GEOMORPHOLOGY OF THE REGION UNDER STUDY - A NOTE

A general study of the longitudinal profiles of all the major rivers in the region under study shows a steep fall in their initial stage (i.e., representing youth phase and thereafter). They then open up, become broad and show mature phase. In the youth phase, the rivers cut through narrow hilly tracts exposing pebbly gravel beds overlain by low sections. The initial course of mature phase cliff sections exclusively of silt are very high with the height ranging from 5-6 m above the bed level on either side or sometimes covered with thick vegetation. Therefore, in this stretch of the rivers, gravel deposit is not to be seen. There are certain locations in the valleys where the rocky outcrops are seen projecting from the river bed and in some occasions, the bed rock is entrenched by the rivers. It is observed that the Hemavati and Bhadra valleys are relatively broader near the source probably due to continuous erosional activity of the stream. The rivers widen further downstream with developed meanders and in the later half of the matured phase, they develop into broad flood plains. Gravel beds noticed in the main river section along their tributaries and nullahs do not indicate any destorted picture and the depositions are almost identical. However, cemented beds are available only in the cliff sections of the main rivers and absent in the sections of the tributaries. Cemented gravel beds located in the Tunga are composed of pebbles of varying sizes, kankar and granular sand are similar in composition. In the Upper Kaveri, cemnted gravel beds are composed of kankar and pebbles of larger dimensions than the ones observed in the Tunga valley. Similar feature is noticed at Kattebelguli and other sites in the Lower Hemavati valley. An interesting feature of the Kattebelguli site is the occurrence of tools in the cemented bed. In contrast, not even a single cemented gravel bed could be seen in the Upper Tungabhadra and Bhadra valleys where gravel is represented by loose pebbles mixed with kankar and granular sand, etc. However, in all the river valleys, upper portion of pebbly gravel is characterised by the presence of loose matrix of granular sand, medium to small size

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pebbles and kankar. The whole mechanism of gravel formation which looks similar in almost all the river valleys in this region is indicative of continuous aggradation during a specific period of time which occurs right from the source upto down stream although the region under study falls under different geographic units and variations in local rock formations. The ancient gravel bed do not differ much from the modern bed deposits particularly near the stream bed. However, patches of grey sand observed over the exposed pebble bed in Kaveri valley is presumably of recent origin. Likewise, sand bed observed in the Upper Tungabhadra, Bhadra and Lower Tunga are also modern. The alluvium noticed in the river valleys differ in thickness from place to place and valley to valley. In the Upper Kaveri, the thickness varies between 4 - 6 m. It is slopy towards the river bed in its initial course and straightens up in its down stream course and is exclusively silty. In the Hemavati, the alluvium has high percentage of granular sand and slightly brownish in colour while in the down stream, colour changes from brown to white and again to brown. The average maximum and minimum thickness is 7 m and 1.5 m respectively and is essentially silty. In the Bhadra and Tunga, alluvium deposit is predominantly silty with the thickness varying from 2 m to 10 m. The alluvium in the Upper Tungabhadra with its well developed flood plain, varies in height from 6 m to 12 m and is essentially composed of reddish mix of sand silt. However, contents of silt seems to be predominant. Silt sections run in these river valleys to a considerable distance of 1 Km to 4 - 5 Km at a stretch. The present river channel bed is comparatively narrow in the Upper Tungabhadra and Kaveri valleys. Therefore, the number of pebbles spread in these valleys seem to have been deposited sufficiently early and only occasion when they are disturbed by way of transportation, etc. during the floods in the Monsoon period between May and August. However, in the Hemavati, the Bhadra and in the Tunga, the present stream flows very close to the existing sections most of the year except for a few places in the Lower Tunga such as Honnapura. The above feature is indicative of the high percentage of

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discharge resulting in depositions of gravels to an average thickness of 60 to 80 cm in the ancient times. As already mentioned, in the Lower Tungabhadra, occurrence of two terraces were noticed by Seshadri (1956) but in its upper reaches, no such direct evidence come to light in the region under study. A pebbly gravel deposit noticed in one of the pit sections about 1 Km to the west of the river bank at Hadonahalli may indicate the existence of an earlier terrace. Contour study of the surroundings did not reveal any clue to substantiate this view. However, further systematic study of the formation of rivers, analysis of sediment samples and contemporary climatic changes may throw more light on the problem of the river terraces. Absence of terraces in other river valleys of the region is also noteworthy in this context.

In the light of the above observations, the characteristic geomorphological features of the region could be summerised as thus: (i) considerable undercutting of the oldest bed rock of the Dharwar systems indicate intesnive erosional phase; (ii) unlike two aggradational phases noticed elsewhere in the Peninsular India in the south-western part of Karnataka, tentative stratigraphical position of pleistocene deposits observed in the cliff sections of the rivers and streams indicate generally one aggradational phase with exceptions at two sites in the Hemavati and the Upper Tungabhadra where two grounds are lying one above the other is noticed; (iii) the tall silty sections over-imposing the gravel bed indicate continuous dry phase in which rivers alluviated their valleys with finer silt and sand.

Fossils in the gravels as well as other deposits (except a portion of an oyster shell) could not be noticed making it rather difficult to ascertain the probable dates of the formations as well as the lithic industries noticed in these sites.

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CHAPTER II

LOWER PALAEOLITHIC SITES

Lower Palaeolithic culture of "Malnad Region" - forming the south-western part of Karnataka comprising the present districts of Shimoga, Chimagalur and Hassan - is less known when compared to the others parts of Karnataka particularly north Karnataka. Pre-historic cultural relics in "Malnad" were first noticed in 1886 by Robert Bruce Foote when he picked up two pebble tools from a 'shingle bed' at Nyamti in district Shimoga during his geological studies of the region. He further reported the occurrence of 'Palaeoliths' at three sites, viz., Kadur, Lingadahalli and Nidaghatta in Chikmagalur district (Bruce Foote, 1901).

The first Palaeolith in India was picked up by Bruce Foote in 1863 from the laterite bed at Pallavaram in Tamilnadu. Since then numerous Lower Palaeolithic sites have been brought to light by various foreign and indegenous scholars by extensive field work. Except for few pockets, practically almost in every part of the country, the Lower Palaeolithic artefacts have been noticed, particularly in the river valleys. Some of the important studies carried out in the river valleys such as Sohan (Deterra & Patterson, 1939), Sabarmati basin ((Zeuner, 1950), Singrauli basin (Krishnaswamy, Soundararajan, 1951), Beas and Banganga (Lal, 1956), Kortalayar valley (Krsihnaswamy, 1938), Guler (Joshi, 1968), Krishna valley (Soundararajan, 1961-62), Narmada valley (Wainright, 1964), Son valley (Nisar Ahmed, 1966), Pravara basin (Corvinus, 1970) and Luni valley (Mishra, 1977) have revealed detailed information about the occurrence of Lower Palaeolithic cultural reamins in stratigraphical context along with the probable climatic conditions. It is interesting to note that few dwelling sits of the period such as at Bhimbetka (Madhya Pradesh), Chirki-Nevasa (Maharashtra) and Hunsgi (Karnataka) have been subjected to excavations to understand settlement pattern. Occurrence of fossils of Elephas nomadicus (Sohan valley), Bos Babalus and Cervus (Narmada and Godavari valley), Bos Nomadicus, Sus, Elephas, etc. (Belan valley), along with Lower Palaeolithic tool bearing deposits is noteworthy.

Although the existence of the Lower Palaeolithic sites were first noticed in southern districts of Karnataka, it is only in northern Karnataka that systematic pliestocene studies were undertaken to understand the Lower Palaeolithic culture in its proper stratigraphical context. Particular mention may be made of the work done in the Malaprabha basin (Joshi, 1955), Upper Krishna valley (Pappu, 1974) and Shorapur doab (Paddayya, 1968). Detailed study of artefacts in the first two valleys have brought to light two distinct cultural horizons represented by the Lower Palaeolithic and the Middle Palaeolithic industries ascribable to the aggradational phases noticed by them. Pre-historic investigations carried out in the Shorapur doab region has brought to light a prolific acheulian industry, the tool kit of which comprises of hand axes, discoids, knives and cleavers. Use of lime stone for manufacturing tools in the doab sites is interesting (Paddayya, 1968). Explorations in the right bank of the river Tungabhadra at Nittur near Tekkalakota in district Bellary, revealed pebble tools along with fossilized animal bones of Bos Nomadicus. A few Middle Palaeolithic tools were also found from the gravel bed. This mixed industry is one of its kind found in the Lower Tungabhadra (Ansari, 1970). Few decades back, a similar industry comprising Lower and Middle Palaeolithic artefacts was reported further upstream of Nittur at Hampasagara in the same river valley (Seshadri, 1956). Besides, a large number of Palaeolithic sites have been reported from Gulbarga, Bijapur, Dharwar and Belgaum districts (IAR 1955 to 1979) in northern Karnataka.

Hitherto, pre-historic investigation in southern Karnataka has been sporadic. So far, no systematic study of the Palaeolithic industries and their main features have been attempted, in the absence of which, it is difficult to assess the pre-historic potentiality of the southern Karnataka.

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LOWER PALAEOLITHIC SITES : THE UPPER TUNGABHADRA VALLEY

A stretch of 60 Kms of the Upper Tungabhadra, i.e., from Kudli where the Tunga and Bhadra meet, to Konantale, the last village in Shimoga district along the Upper Tungabhadra, has been intensively surveyed. Lower Palaeolithic tools could be collected in six of the localities from Hadonahalli to Sudur (the latter located on the bank of the river Kumudvati, a tributary to the Upper Tungabhadra in this stretch. The distance between these two localities is approximately 45 Kms as crow flys).

Flora: The stretch of plain of the Tungabhadra proper is generally Maidan area having trees of smaller growth and thorny species comprising Dindiga (Anogeissus latifolia, Wall), Ippe (Bassia longifolia, Macrbride), Bevu (Azadirachta indica, A.Juss), Alale (Terminalia chebula, Retz), Nelli (Emblica officinalis, Gaertn), Srgandha (Samta-um album, Linn), Honge (Pongamia pinnata, Pirre), Bilijali (Acacia leucopholea), etc. The middle part of the Kumudvati, a tributary of the Upper Tungabhadra where the site Sudur is located, is comparatively with moderate to thick forest area comprising Saguvani (Tectona grandis, Linn.f), Beete (Dalbergia latifolia, Roxb), Honne (Pterocarpus marsupium, Roxb), Jambe (Xylia dolabriformis, benth), Kanagalu (Dillenia indica, Linn), etc.

Fauna: The fauna of the region met with in mammal group include wild Boar, wild Pig, Porcupine, Loin tailed Macaque, Jackal, wild Dog, etc. Birds found in the region include Teal, Duck, wild Geese, King Fisher, Jungle Crow, Parrot, Peacock, Heron and Stork. Varieties of reptiles such as Snake, Tortoise are met with. Fish fauna group consists of Carp, Scorpian fish, cat fish, Masshur, Murrel fidler, Eel and other varieties.

Environment: The environmental conditions seem to have been very favourable to human living, and would not have been very much different in the Middle and Upper Pliestocene periods. For, recent

investigations in Hunsgi valley (Paddayya, 1985) have indicated no striking change in the environmental condition from the pre-historic times to the present day. Probably, weather would have been more cold and rain fall also more, consequently the present Maidan would have been more green with atleast moderate forest. On the whole, the conditions, it would appear, in the pre-historic time, was favourable for human living. The rain fall in this region varies from 600 m to 1000 m.

Stratigraphy: The Upper Tungabhadra

This important river in the northern most limits of the region under study is formed by the confluence of the Tunga and the Bhadra at Kudli about 25 Kms north-east of Shimoga town. Due to twin composition of the rivers, the Upper Tungabhadra attains big proportion in its width and flows in a broad valley exhibiting mature phase. From Kudli, it runs for a distance of 60 Kms in Shimoga district. Thereafter, it enters Dharwar district in Konantale. The present investigation to understand the stratigraphy of deposits is restricted to its flow in Shimoga district only.

In its 60 Kms run in Shimoga district, the river has exposed a few cliff sections at various localities and the same were examined for fixing a tentative stratigraphy of deposits. The sequence of deposits observed in five localities are discussed below.

From its source at Kudli upto Konantale in five localities yielding Lower Palaeolithic tools, viz., Nagasamudra, Hadonahalli, Vaderpura, Govinkovi and Chikbasur, cliff sections both on the left and right sides are composed of bed rock at the bottom (gneiss) overlain by pebbly gravel almost loose in nature varying in thickness from 50 cms to 90 cms. Above this gravel rests silt deposit, brown to reddish in colour, varying in thickness from 4 m to 7 m. In some places, silt is found mixed with patches of kankar (for example at Govinkovi).

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Lower Palaeolithic and Middle Palaeolithic artefacts occur in the loose pebbly gravel. None of the specimens are found in the gravel section. It is interesting to note that the Middle Palaeolithic, Upper Palaeolithic, Mesolithic and Neolithic sites are also found in the vicinity of the Lower Palaeolithic sites indicating continuous occupation of the area by pre-historic people. The exposed pebble beds vary in measurements. The largest pebble bed site measures 500 m north-south x 100 m east-west and the smallest measures 60 m north-south x 15 m east-west.

In the remaining stretch, i.e., from Kudli to Nagasamudra, from Mangote upto Vaderpura and from Nimbegondi upto Govinkovi, from Hottapura to Chikbasur and from Benakanahalli upto Honnali and further upto Konantale (where the river enters the district Dharwar), the cliff sections of the river are exclusively composed of reddish sandy silt varying in height from 3 to 8 m. In some places gneiss outcrops are seen protruding from the river bed or they are seen lining the river section. Patches of kankar mixed with silt is seen in few points. In many places, cliff sections are steep and where they are slopy, grass has grown over the surface. Small deciduous forested hillocks are located near Chillur, Benakanahalli and Haraganahalli in this stretch of the Upper Tungabhadra. From the above survey of the cliff sections wherever present, the general stratigraphy of the river section may be reconstructed as follows; from top to bottom.

(a) Red to brownish silt mixed with thin, fine sand ranging from two metres to six metres in thickness.

(b) Pebbly gravel (not continuously present).

(c) Bed rock (gneiss).

During the survey in the vicinity of Hadonahalli village about 1 Km from the present river bank, at a higher level, a small patch of pebbly gravel is noticed at a depth of 40-60 cms below the surface in a

trench dug by the Public Works Department of the Government of Karnataka. This probably suggests the existence of an earlier terrace in the valley. It is pertinent to recall the observations of Seshadri who accompanied Zeuner in his expedition in 1950 for investigating the pleistocene deposits in the Lower Tungabhadra valley at Hampasagara, north of Hospet in district Bellary (Karnataka), which falls in the Maidan tract of the valley. He opines "The section extending to the higher level shows loose gravel on rock, covered by kankarised gravel and about 10' of kankarised silt. This carries a soil section with a Grey A - horizon (2') and a Brown B - horizon (7')" (Seshadri, 1956). These observations seem to confirm more or less the observations made by me in the upper part of the Tungabhadra described above.

No tools as such are found in the section proper in the pit at the upper level. However, the pebbles of the river bed and of the layer in the pit are one and the same. It is, therefore, reasonable to associate these two with this layer although the period of their use can not be exactly determined in the present stage of our knowledge.

Rock material: Geologically, the area falls into gneissic complex. In the river bed, large patches of quartzite pebbles are also noticed. Majority of tools, essentially made on core using the brown coloured quartzite pebbles with saccharoidal texture containing inclusions of magnetite, are available in abundance in the exposed loose gravel beds, probably derived from the quartzite formations of the Dharwars surrouding the gneiss. Few unfinished tools and flakes are also found in the loose pebbly gravel indicating that the pre-historic men used these gravel beds as factory sites. Small percentage of tools are found made on quartz also. However, most of the tool repertoire from Nyamti are made on brownish epidote quartzite having thin layers of magnetite.

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Tool types

Hand axe	Discoid	Cleaver	Scraper	Unidentified artefacts
6	7	8	9	10
9	1	-	3	3
2	-	-	-	1
1	-	-	-	-
2	1	-	1	-
4	-	-	1	-
3	-	-	2	1
21(52.5%)	2 (5%	-	7(17.5%)	5 (12.5%)

Pebble group: This group is characterised by small proportion of artefacts noticed in three sites, namely, Chikbasur, Sudur and Nyamti in the Upper Tungabhadra valley proper and in the Kumudvati and Hirehalla, its tributaries respectively have yielded pebble tools totalling five in number of which, three are rolled and the rest are fresh. All the artefacts are made on the riverborne quartzite pebbles of brown colour. The bifacial chopper from Nyamti made on an end portion of a pebble has brownish core and the exterior has white surface due to weathering. No patination is seen on the tools. Rolled artefacts have blunt cutting edge while it is very sharp and distinctly visible on the three chopping tools from Chikbasur and deep flaking with prominent scars in the unifacial chopper from Nyamti, all indicative of the use of stone hammer technique.

Chopper chopping artefacts of the Upper Tungabhadra: As is well known, the term chopper chopping was coined by Movius (1948). The five pebble tools in the collection are divided into two usual groups:

(a) Unifacial chopper
(b) Bifacial chopper

Table No. 2

Typological classiffication of Chopper chopping tools from the Upper Tungabhadra and its tributaries

Sl No.	Site	River/Stream	Tool type	Number	Percent
1	Sudur	Kumudvatı	Unıfacıal	2	60%
2	Nyamti	Hırehalla	Unıfacıal	1	
3	Chıkbasur	Upper Tungabhadra	Bıfacıal	2	40%

Table No. 3

Metrical analysis of Chopper chopping specimens in the Upper Tungabhadra valley

Sl. No.	Sıte	Tool type	Measurment ın cms			Shape of cuttıng edge
			Length	Breadth	Thıckness	
1	Chıkbasur	Bıfacıal chopper	10.1	8.7	4.4	Convex
2	-do-	-do-	9.6	8.3	3.7	"
3	Sudur	Unıfacıal chopper	8.5	7.5	5.0	"
4	-do-	-do-	13.1	10.7	6.8	"
5	Nyamtı	-do-	10.2	8.0	5.7	"

Unıfacıal chopper has convex workıng edge and thıck round bottom. Flakes have been removed at 80° angle. At the left lateral end, flakıng ıs not unıform probably due to ınferıor qualıty of stone used. Bıfacıal choppers havıng convex workıng edge are made on flat pebbles wıth thın round bottom. Whıle one ıs ın mınt condıtıon, other one ıs slıghtly rolled. Table No. 3 shows that the choppıng made on thıck pebbles are common ın the trıbutarıes than ın the maın rıver valley

where thin pebbles are preferred. This is a tentative observation. More work in this field is wanting.

Summary: Though the specimens picked up are small in number, they indicate the presence of both the types noticed in other adjacent regions. The unifacial choppers are thick and heavy. This sectioned pebbles are used for bifacial choppers. All the five tools are made on river borne pebbles and exhibit controlled workmanship. Prominent flake ridges on the artefacts is an interesting feature. Alternate flaking adopted to attain zigzag working edge exhibits the use of stone hammer technique. 60% of the specimens found rolled seems due to "in-situ" rolling of pebbles in the gravel bed. the remaining 40% of the specimens are fresh and indicate that they are derived from the nearby gravel bed which is undergoing constant erosion.

Pebble tools account for only 14.28% of the total collection of Lower Palaeoliths. Hence, detailed metrical analysis has not been done. Also the occurence of pebble tool is very negligible. It substantiates the existence of the mixed pebble and hand axe industries noticed elsewhere in the Peninlsular India in the northern Karnataka, Andhra and Maharashtra sites.

Core and flake group: Compared with the number of pebble - choppers discussed above, the percentage of tools made on cores and flakes such as hand axes, discoids and scrapers are more in the Lower Palaeolithic sites of the Upper Tungabhadra valley and her tributaries (Table No. 4).

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Table No. 4

Distribution of various types of Hand Axes in the Upper Tungabhadra valley

Site	River valley/ Tributary	Tria-ngular	Oval	Cordiform	Total	Percen-tage
1	2	3	4	5	6	7
a) ON CORE						
i) Hadonahalli	Upper Tungabhadra	-	-	1	1	8.33
ii) Vaderpura	-do-	-	1	-	1	8.33
iii) Nagasamudra	-do-	3	1	2	6	50.00
iv) Nyamti	Hirehalla	1	2	-	3	25.00
v) Sudur	Kumudvati	-	1	-	1	8.33
		4 33.33%	5 41.66%	3 25%	12	99.99

1	2	3	4	5	6	7
b) ON FLAKE						
i) Hadonahalli	Upper Tungabhdra	1	-	-	1	11.11
ii) Vaderpura	-do-	1	-	-	1	11.11
iii) Nagasamudra	-do-	3	-	-	3	33.33
iv) Chikbasur	-do-	1	-	-	1	11.11
v) Sudur	Kumudvati	-	-	3	3	33.33
vi) Nyamti	Hirehalla	-	-	-	-	-
		6 66.66%	-	3 33.33%	9	99.99

The above table shows preference of core (57.15%) over flake (42.85%) for manufacturing hand axes.

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As already mentioned, in 1886, Bruce Foote noticed a few Palaeoliths from four sites in the Shimoga and Chikmagalur districts. Subsequently, few Palaeolithic tools were reported from Kibbanahalli in Tumkur district (Sampath Iyengar, 1924). Seshadri (1956) has made a detailed study of this collection comprising Lower Palaeolithic and Middle Palaeolithic artefacts. Further, he also reported the occurrence of Palaeoliths at Karadigudda in Hassan district.

Explorations conducted in the river valleys in the Malnad region has yielded twentytwo new Lower Palaeolithic sites, besides the previously known, viz., Nyamti, Nidaghatta, Lingadahalli and Kadur (Bruce Foote, 1901), all located in the tributaries of the river Tungabhadra. The newly found sites situated in the main river bed include Nagasamudra, Hadonahalli, Chikbasur, Vaderpura in the Upper Tungabhadra; Barandur, Dodgopenahalli, Sidhlipura, Balehonnur, Kagganahalla in the Bhadra; Honnapura, Pilangere, Harihara pura in the Tunga; Benkal, Kattebelguli in the Hemavati and Rudrapatna and Konanur in the Upper Kaveri valley. Other new sites located in the region include Sudur, Agrahara, Lakya in the Kumudvati and the Veda systems in the Tungabhadra basin. Shankaraghatta and Khandya are situated near the streams feeding the river Bhadra. Tool types and their type-technological aspects have been described from each of the river valley and their tributaries. Comparative study of industries found within the region under reference and with the sites in the neighbouring region has also been attempted. Raw materials used and techniques adopted to manufacture tools have been highlighted at appropriate places. Discussion is arranged in the following order. (a) Upper Tungabhadra valley, (b) Tunga valley, (c) Bhadra valley, (d) Hemavati valley and (e) Kaveri valley. Sites in the interiors have been put under sub-systems of the respective valleys.

As is evident, there are in all twentyone hand axes in the collection belonging to different catagories of types constituting 60% of the total collection. Based on the physical features, they are divided into two groups, namely,

a) Hand axes made on cores
b) Hand axes made on flakes

Hand axes on cores: Irregular blocks of desired size or the pebbles available in plenty in the pebble beds or large flakes detached from pebbles are normally used to manufacture hand axes. It is one of the earliest tool types. It is worked on both the faces and hence called bifacial. Some times, only one side is flaked leaving the cortex, called unifacial. Its working end is always thin, pointed and its bottom or butt end is thick. Ovate also falls into bifacial category but invariably they have thin working edge alround. Hand axe assemblage could be divided into two groups judging by the flaking on them.

Pebble and butted axes: Of the 21 hand axes, two are pebble butted (9.5%) and the remaining 19(90.5%) specimens are fully flaked. Pebble butted hand axes are made on elongated pebbles. These have thick butt and the tip is thin and triangular in shape. One specimen exhibits shallow flaking of lateral margins upto the middle having zigzag working edge. These are symmetrical with biconvex cross sections. Both stone hammer and cylindrical hammer techniques seem to have been employed.

Fully flaked axes: Majority of the hand axes on core are fully flaked constituting 57.2% of the collection. However, only a few hand axes (16.6%) are fresh. These with regular working end and step flake scars suggest the employment of both the stone hammer and cylindrical hammer techniques. The remaining axes are found in semi-rolled condition making it rather difficult to ascertain the exact techniques employed for flaking. Of the 12 hand axes (partly and fully worked)

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majority are oval shaped (5 Nos.) followed by triangular shaped ones (4 Nos.) and cordiforms (3 Nos.) (Table 4). Most of the specimens are thick at the centre, have prominent mid rib and usually are bi-convex in section. Concave margins in a few axes may indicate that these were hafted, a feature noticed elsewhere in the Upper Krishna valley (Pappu, 1974).

Table No. 5

Metrical analysis of hand axes made on core

No.	Site	Maximum length	Maximum breadth	Maximim thickness
1	Nyamti	200 mm	110 mm	83 mm
2	"	130 mm	80 mm	52 mm
3	"	125 mm	70 mm	70 mm
4	Nagasamudra	170 mm	120 mm	88 mm
5	"	145 mm	110 mm	77 mm
6	"	110 mm	80 mm	60 mm
7	"	150 mm	90 mm	50 mm
8	"	95 mm	80 mm	50 mm
9	"	115 mm	100 mm	70 mm
10	Hadonahalli	135 mm	100 mm	70 mm
11	Vaderpura	150 mm	130 mm	55 mm
12	Sudur	105 mm	75 mm	49 mm

The maximum length of hand axes on core, as can be seen from the table, measures 200 mm while the smallest hand axe measures 95 mm. Of the 12 specimens, two fall within the range of 200 mm to 170 mm accounting for 16.66% of the total. The remaining tools (9 Nos.) range between 150 mm to 95 mm (83.34%). Likewise, the maximum breadth of the hand axe in this group measures 130 mm and minimum 70 mm. Two groups are identified (1) those which fall between 130 mm to 100 mm

(50%) and (11) between 90 mm to 70 mm (50%). Thickness of tools also varies. The maximum thickness is 88 mm and the minimum is 49 mm. While 7 specimens fall between 88 mm to 60 mm (58.40%), the remaining 5 specimens fall between 50 mm and 49 mm (41.60%). Variation in the dimensions also indicate various types of hand axes. Frequency in length seems to suggest preference of Pebbles measuring 100 mm and above. Thickness is fairly even in all the specimens.

Hand axes on flakes: There are in all 9 hand axes made on flakes obtained from the large pebbles in the river bed. Two hand axes are made on side flakes and the remaining specimens are classified under indeterminate group as the platforms are not clearly visible.

All the 9 specimens fall under the category of unifacial hand axes. These have deep flake scars ranging from 3 to 8 in number found on dorsal surface. A few specimens are marginally retouched and have prominent mid rib. One specimen has pebble cortex. Deliberate removal of flakes vertically at the laterite ends to obtain what looks like a pointed tip is noteworthy. Few have symmetrical margins. Specimens having twisted or zigzag profile probably indicate their unfinished character. While 20% of the assemblage is fresh, 80% is found in rolled or semi-rolled condition rendering it difficult to analyse the angles adopted to remove flakes etc. Shapes of hand axes are given in the table below:

Table No. 6

Hand Axe types on flakes

No.	Site	River valley	Triangular	Oval
1.	Nagasamudra	Upper Tungabhdra	3	-
2.	Hadonahalli	-do-	1	-
3.	Vaderpura	-do-	1	-
4.	Chikbasur	-do-	1	-
5.	Sudur	Kumudvati	-	3
			6	3

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Hand axes from Nagasamudra are triangular in cross section and the remaining bi-convex in cross section. Step flake scars in some are perhaps due to the cleavage of the rock rather than deliberate working. Side flakes have one face each produced by fracture. Prominent ridges on the upper surface, deep flake scars and limited secondary retouch work tend to suggest the use of stone hammer technique. Limited secondary retouching may indicate use of cylinder hammer technique also.

Table No. 7

Metrical analysis of Hand Axe on flakes

Site		Length in mm	Breadth in mm	Thickness in mm
a) Nagasamudra	1)	125	100	70
	2)	125	100	55
	3)	160	100	50
b) Chikbasur	4)	100	80	40
c) Vaderpura	5)	115	70	35
d) Hadonahalli	6)	120	90	50
e) Sudur	7)	105	80	20
	8)	130	95	45
	9)	140	110	40

As seen from the above table, variation in length is noticeable. Maximum is 160 mm. Smallest hand axe measures 100 mm. This difference however does not indicate any typical feature. Tools ranging between 120 mm-100 mm constitute the bulk with 44.4%. Tools between 130 mm-125 mm form 33.3% while those fall between 160 mmm-140 mm form 22.2% of the total collection. Breadthwise, there seems to be little confirmity with the general pattern as 55.5% of the tools fall between 95 mm to 70 mm while the rest between 110 mm to 100 mm form 44.4% of the collection. Thickness varies considerably. The minimum

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is 20 mm while the maximum is 70 mm. By and large, flake tools show consistency and definite pattern compared to hand axes on core.

Discoids: Discoids constitute 5.72% of the entire collection. These are circular artefacts made on core or flake usually bifacially worked. Flaking is employed around to obtain circular shape. Thick at the centre and exhibit shallow flake scars. Prominent protrusion at the centre is a common feature. Two specimens are made on quartzite pebble and the other on a flake, all brown in colour. In the Upper Tungabhadra river proper, this type is not located. Both the specimens are from its tributaries. Disc from Sudur is slightly rolled. Its periphery around is zigzag. The specimen from Nyamti is fresh. Thin flakes have been removed around. Working on the ventral surface clearly indicates the employment of levallois technique. Sudur specimen exhibits use of stone hammer as well as cylindrical hammer techniques. The exact use of this tool is not known.

Scrapers: This is one of the important types which commonly occur in the Palaeolithic cultures. There are in all seven scrapers collected from four sites, constituting 20% of the entire collection. These are divisible into three sub-types, namely, side scrapers, double sided scrapers and end scrapers.

Table No. 9

Typological distribution of Scrapers

	Type	Nagasamudra	Sudur	Nyamti	Vaderpura	Total	Percentage
1.	Side scrapers	2	-	-	-	2	28.57
2.	End scrapers	1	-	-	1	2	28.57
3.	Double sided scrapers	-	1	2	-	3	42.85
		3	1	2	1	7	99.99

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Two end scrapers are made on core and remaining five are made on thick flake. Depending on the workmanship noticed on the lateral sides they have been classified under the above mentioned categories.

Side scrapers: In this group, one side of the tool is worked lengthwise by retouching. Both core and flake are used. In the double side scraper category, retouching is done on both the borders to obtain working edge.

The assemblage comprises of three side scrapers and two double sided scrapers. Faceted platform is visible on four tools. Bulb of percussion is prominent in the rectangular double sided scraper. One of the side scrapers having beak shaped tip is noteworthy. The double sided scraper with tang suggests use of hafting. All the scrapers are made on thick flakes. Flake scars are prominent in four scrapers while the fifth one from Vaderpura is heavily rolled. Four tools exhibit triangular section. One has bi-convex section. Workmanship noticed on the tools with thin elongated flake scars and secondary retouch work on the edges indicate the use of cylindrical hammer technique.

End scrapers: In this category, extreme ends are retouched to obtain working or scraping edges. Thin blades, flakes or cores are used. In the present case, cores have been used.

Both are fresh. In one artefact, flakes have been removed from both the dorsal and ventral sides while in the other, thin flakes are removed from the dorsal surface only. Ventral surface is flat, working edges are wavy. One has triangular section, the other has plain convex section.

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Table No. 9

Metrical analysis of Scraper group

Site	Tool No.	Length in mm	Breadth in mm	Thickness in mm
1. Nagasamdura	1	100	80	40
	2	85	60	30
	3	80	65	40
2. Vaderpura	4	85	65	25
3. Sudur	5	85	65	30
4. Nyamti	6	90	80	50
	7	110	60	30

From the above table, it can be seen that there is a similarity between different types of scrapers. Variation in length, breadth and thickness is meagre. However, those which fall between 90-80 mm in length, 65 mm - 60 mm in breadth and 25 mm - 30 mm in thickness are more frequent than others. This group accounts for almost 70% of the collection.

General observations: Detailed work undertaken in the Upper Tungabhadra between Konantale and Kudli and in the tributaries fruther west of the main river has been rewarding for, a number of sites yielding Lower Palaeoliths have been located. These are situated in different geo-setting, viz. (a) Sites in the 'Maidan' belt with semi-arid ecological conditions (b) In the Semi-Malnad and in the thick forested 'Malnad' belt, whether the same ecological situations prevailed in the past, particularly during the pre-historic times requires thorough interdisciplinary study.

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The tool kit noticed in the region are surface finds comprising of choppers, hand axes, discs, scrapers, borers and points. The raw material used in preparing artefacts is essentially quartzite of different shades and colours, available in plenty in the form of river borne pebbles in these sites. Few are made on quartz also. From a close examination of the flaking system and massiveness of artefacts (hand axe group), it is apparent that abbevillian technique has been employed in preparing hand axes noticed at both Nagasamudra and Vaderpura. Other artefacts in the Upper Tungabhadra exhibit acheulian features of different stages. A significant feature is the tools rarely show any extensive retouch. However, the best example of the employment of advanced acheulian technique with extensive retouch is found in the artefacts picked up from Nyamti. Interestingly in none of the sites artefacts are found in clusters. A few artefacts particularly discoids represent levallois technique. Another feature of this culture in the region is the absence of cleaver group. This needs to be examined in detail.

Lower Palaeolithic sites in the tributaries of the Upper Tungabhadra(north-east and south-west Malnad region)

The Lower Palaeolithic aretefacts noticed in the tributaries of the Tungabhadra and near the lakes in the above region have been described seperately as they indicate a slightly developed stage of the culture. River systems, stratigraphy, tool descriptions, etc. have been dealt in detail, besides analysing their metrical characters.

A portion of the eastern belt of the Maidan is drained by Vedavati formed by a series of streams flowing down the eastern slopes of hillocks in Chikmagalur and Kadur taluks of Chikmagalur district. Hence, stratigraphy of important streams are discussed below.

The Kudida (Agrahara): This is one of the important streams feeding the Vedavati, a tributary of the Tungabhadra. It flows in the eastern limits of Chikmagalur district. A small cliff section examined at Agrahara revealed a 0.80 m thick loose pebbly gravel over-imposed by a layer of brownish sandy silt measuring 0.50 cm in thickness. From the surface of loose pebbly gravel, few Palaeoliths made on flake were obtained. The slopy pebble bed measures 30 m north-south x 6 m east-west. The base of the gravel is not exposed.

The Hulihalla: About 20 Km south of Sakrepatna at Nidaghatta, another cliff section on the right bank of a nullah locally known as Hulihalla, was examined. It rises at the Nidaghattagudda about 3 Km north of the village and after flowing in different directions, it joins the Vedavati river. It is active only during the monsoon and remains dry most of the year. The cliff section exposed on the right bank revealed the following stratigraphy. Over the rock rests 30-40 cms thick brownish clay overlain by 60 cm thick gravel which is over-imposed by brownish clay measuring 0.70 m to 1 m height. Above this rests small strip of pellet gravel of 5 to 10 cm thick overlain by 60-80 cm thick reddish silt. From the loose pebble bed in the stream bed, pebble tools, hand axes and other flake tools were obained. Pebbles are strewn in the nearby fields also. This is one of the four sites where Bruce Foote collected Palaeoliths in 1886 from laterite debris.

Lower Palaeolithic sites in the Vedavati, District Chikmagalur

Lower Palaeolithic sites in the north-eastern and south-western part of the eastern Maidan belt of the central Malnad region (mostly in the eastern plains with typical maidan features) comprising the present Chikmagalur district (formerly known as Kadur district) were brought to light as early as in 1886 when Bruce Foote picked up hand axes, discs and ovates from as many as three sites, viz., Lingadahalli,

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Nidaghatta and Kadur. Specımens collected by hım were few and far between to understand the nature of ındustry and ıts typo-technologıcal aspects. Fresh ınvestigations conducted ın the regıon revealed a few new sıtes. These are sıtuated ın two dıfferent locatıons vız. (a) sıtes ın the stream beds & (b) lake sıde sıtes. Sıtes of the fırst group notıced ın Sakrepatna and Chıkmagalur talukas of the regıon are near the stream beds ın the upper reaches of the Vedavatı, one of the ımportant tributarıes of the Tungabhadra. The factory sıte at Nidaghatta is the most ımportant ın thıs group comprısıng choppers, hand axes, discs, scrapers, etc. The lake sıde sıte of the second group ıs notıced at Gedlahallı ın Kadur taluk ın Chıkmagalur dıstrıct. Thıs agaın ıs a factory sıte sıtuated 6 Km south-east of Kadur town about 1.5 Km of a lake locally called 'Tanalıkere'. Tool repertoıre include hand axes, choppers, scrapers, poınts, blades and dıscs dıstınctly dıfferent from other sıtes ın the regıon under study.

The Lower Palaeolithıc assemblages notıced ın these sıtes ın the regıon can be dıvıded ınto two dıstınct categorıes on the basıs of typo-technologıcal features.

I. Pebble tool group represented by unıfacıal and bıfacıal choppers; and

II. Flake group represented by hand axes, scrapers, dıscoıds, solıtary cleaver, poınts, borers and blades.

The followıng table ıllustrates the typologıcal dıstrıbutıon of tools ın the varıous sıtes of the regıon.

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Table No. 10

Typological distribution of artefacts in Vedavati valley

Tools	Sites				Total	Percentage
	Nidaghatta	Agrahara	Lakya	Gedlahalli		
Pebble tool	3	-	-	-	3	5%
Hand axe	7	3	-	11	21	35%
Scraper	9	-	-	8	17	28%
Discoid	1	1	-	4	6	10%
Point	1	-	2	2	5	9%
Borer	3	-	-	1	4	7%
Blade	-	-	-	2	2	4%
Cleaver	-	1	-	-	1	2%
Total	24	5	2	28	59	100%
Percentage	40%	8%	5%	47%	100%	

I. Pebble tool group: All the three specimens were picked up from the dried up bed of a stream at Nidaghatta. These are made on quartzite pebbles of light brown and dark brown colours. One of the specimens displays distinct zigzag working edge recalling the features of early acheulian technique. Flake scars are deep and have prominent ridges. However, in one of the specimens, step flaking has been deliberately employed to straighten the working edge indicating soft hammer technique. Two are made on split pebbles while the third one is made on a large pebble. These constitute 5% of the total collection. All the three specimens are fresh indicating 'in-situ' condition. They fall into the following categories.

a) Unifacial choppers (2%)· The specimen made on a split pebble has convex working edge. Five deep flakes have been detached to obtain a zigzag working edge. Cortex is retained on both the surfaces.

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(b) Bifacial choppers(3%)· These are fashioned on a split pebble and a large pebble respectively. Cutting edge is wavy obtained by alternate flaking. Step flaking to straighten the edge is noteworthy. Number of flake scars vary from 3 - 6 on each surface.

Table No. 11

Metrical analysis of Pebble tools

Sl. No.	Tool type	Cutting edge	Measurement in mm		
			Length	Breadth	Thickness
1	Unifacial chopper	Convex	130	90	60
2	Bifacial chopper	Convex	115	85	75
3	Bifacial chopper	Convex	140	105	80

Summary: Although small in percentage, occurrence of pebble tools in the region is noteworthy. Fresh nature of the pebble tools probably indicate their recent exposure and their manufature in the stream bed. Deep flake scars and prominent ridges suggest early acheulian character of the assemblage. All the specimens have convex working edge and the metrical characters are inter-related indicating preference in selecting pebbles of a definite size. quartzite is the chief rock-material while quartz has also been used for fashioning Lower Palaeoliths in the region but to a lesser extent.

II. Flake tool group: As already mentioned, Lower Palaeolithic sites in the eastern belt of central Malnad region is characterised by predominance of flake tools. Most of these are made on quartzite, a small group is of quartz and dyke is also used to fashion tools. There are in all 57 specimens constituting 95% of the total collection. Typological classification of this group is as follows.

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Table No. 12

Typology of Flake tools

Sl. No.	Tool type	Total No.	Percentage
1	Hand axe	21	37%
2	Scraper	17	30%
3	Borer	4	7%
4	Point	5	9%
5	Discoid	6	11%
6	Cleaver	1	2%
7	Blades	2	4%
	Total	56	100%

Hand axes are fashioned on thick flakes obtained from Pebble as well as natural blocks, as for example at Gedlahalli. The 21 specimens (35%) picked up from loose gravel beds in the streams as well as from sections at Gedlahalli are of varying dimensions and shapes. In few specimens noticed in the stream beds pebble cortex has been retained partially on one side and in some, cortex is retained fully on the ventral side suggesting both unifacial and bifacial working of the specimens. Some have deep flake scars with ridges. Step flaking is employed near the margin in four specimens to attain straight outline. Couple of them have prominent mid-rib on the dorsal. Flake scars vary from 3-15 on one or both the surfaces. Pointed tip is another noteworthy feature. Beak like projection in some specimens are comparable to similar types, noticed from the Upper Krishna basin (Pappu, 1974). Faceted platforms are also visible in a few specimens. Attempt to produce tang for hafting is noteworthy. In the collection, unifacially flaked axes account for 18.18% while bifacially flaked axes account for 81.18%. Comparatively, Hand axe collection from the Gedlahalli site exhibit uniformity both in size as well as technique adopted to fashion them. Size varies from medium to small.

Unlike the stream bed sites where plenty of pebbles are available, the tool repertoire is essentially made on quartzite lumps and irregular blocks strewn all over the site. Straight natural portion of the block or flake is retained and the remaining portion is minutely trimmed to the required shape. Most of these exhibit prepared core technique. Stone hammer technique to detach flakes may also have been used. Thin and pointed tips of triangular hand axe is a noteworthy feature. Steps noticed on both the surfaces are probably due to natural cleavage of the rock which is slightly inferior to the rock material used in the stream bed sites. A few specimens also exhibit single platforms along the lateral margins. All these typo-technological features tend to show a developed stage of late Acheulean transforming slowly into the next stage of culture viz. Middle Palaeolithic. Interestingly, all the hand axes are bifacially worked.

Table No. 13

Hand axe types

Sl. No	Hand axe types	Nos.	Percentage
1	Cordiform	3	14%
2	Triangular	8	38%
3	Sub-triangulars	4	19%
4	Oval	6	29%
		21	100%

The above table indicates the dominance of the triangular shape followed by oval shape. These features are probably due to the use of rectangular flakes as is evident from the working noticed in the flake axes.

Table No. 14

Frequency of cross sections - Hand axes

Sl. No.	Cross section	No. of specimens	Percentage
1	Triangular	3	14%
2	Plano-convex	7	33%
3	Bi-convex	11	53%
		21	100%

Table No. 15

Different rock material used : Hand axes

Sl. No.	No. of specimens	Rock material	Percentage
1	14	Quartzite	66.66%
2	6	Quartz	28.57%
3	1	Dyke	5.76%
	21		99.99%

Obviously hand axes of quartzite of brown and light brown colour are dominant. Use of dyke as raw material is a noteworthy feature.

Table No. 16

Metrical analysis of Hand axe group

(a) Length

Sl. No.	Range in mm	No. of specimens	Percentage
1	80 to 90	2	9.52%
2	90 to 100	8	38.10%
3	100 to 110	7	33.33%
4	110 to 120	2	9.52%
5.	120 to 130	2	9.52
		21	99.99%

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The above analysis indicates the dominance of hand axes of 90 mm - 100 mm range closely followed by 100 mm - 110 mm range group. The maximum and minimum length being 130 mm and 90 mm respectively.

(b) Breadth

Sl. No.	Range in mm	No. of specimens	Percentage
1	60 to 70	4	19.05%
2	70 to 80	8	38.09%
3	80 to 90	4	19.05
4	90 to 100	3	14.28
5	100 to 110	2	9.52
		21	99.99%

The maximum and minimum breadth are 100 mm and 60 mm respectively. Obviously the second group of 70 mm to 80 mm dominate.

(c) Thickness

Sl. No.	Range in mm	No. of specimens	Percentage
1	20 to 30	4	19.04%
2	30 to 40	4	19.04%
3	40 to 50	6	28.58%
4	50 to 60	6	28.58%
5	60 to 70	1	4.76%
		21	100.00%

Two groups ranging between 40 mm to 60 mm dominate accounting for 57.15% of the entire group followed by 20 mm to 40 mm group accounting for 38.10%.

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The metrical analysis of hand axes do not indicate preference for a particular type or size. This is obvious because tools are fashioned as per the requirement and depends more on the shape of the flake or the core as the case may be.

2. Scrapers: This is another major group in the assemblage constituting 28% of the total collection. These represent different sub types viz. (a) Side scraper (b) End scraper and (c) Round scraper. Most of the specimens are made on thick medium sized flakes. Step flaking in a few is a noticeable feature. Zigzag working edge indicates alternate flaking. Specimens with cortex and occurrence of levallois flake are other noteworthy features. Besides, prepared platform is also observed. Generally, these artefacts are rectangular in shape. However, few triangular specimens are also noticed. Brownish quartzite and pinkish-white quartz are the rock material used. These are classified into sub types on the basis of retouch observed along the working margins. Scrapers with bi-convex cross section account for 60% and the remaining 40% of the artefacts have triangular cross section.

(a) Side scraper: These are made on thick flakes and account for 35.29% of the total collection. In a few specimens shallow step flaking with numerous ridges is noteworthy. Working edges are retouched on both the dorsal and ventral sides of scrapers from Gedlahalli. While the working edge of scrapers from other sites are thin and straight attained by removing small flakes near the margin on side, broad flake scars and straight margins are also noticed. Some have prominent bulb of percussion. These are mostly rectangular in shape and thick at the centre. Some are made on levallois flake.

(b) End scraper: These are made on both thin and thick flakes and account for 35.29% of the collection. The working edge along the far end is retouched in a few specimens. Gedlahalli specimens are small

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and almost uniform in size. By and large, artefacts are thick at the centre and exhibit prominent mid ridge. Step flaking and prominent bulb of percussion are other noteworthy features.

(c) Round scraper: All the five artefacts are round in shape. These are made on medium sized flakes including a levalloisian flake. The working margins are retouched from both the sides in some and in others either the dorsal or ventral side margins are retouched. Wavy cutting indicates alternate flakings.

Table No. 17

Metrical analysis of Scraper group

Sl. No.	Length	Breadth	Thickness
1	60 mm	53 mm	36 mm
2	66 mm	61 mm	20 mm
3	70 mm	60 mm	40 mm
4	70 mm	65 mm	40 mm
5	70 mm	55 mm	25 mm
6	70 mm	75 mm	25 mm
7	72 mm	64 mm	55 mm
8	80 mm	60 mm	25 mm
9	81 mm	67 mm	35 mm
10	85 mm	35 mm	15 mm
11	85 mm	60 mm	55 mm
12	89 mm	61 mm	28 mm
13	94 mm	73 mm	22 mm
14	96 mm	65 mm	40 mm
15	110 mm	65 mm	30 mm
16	115 mm	95 mm	40 mm
17	140 mm	70 mm	40 mm

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The above analysis shows the longest of the tools measures 140 mm and the shortest one measures 60 mm. Lengthwise two groups are identified, (a) Tools ranging between 70-85 mm and (b) those ranging between 110 - 140 mm. The former is dominating with 64.44%.

The narrowest tool of this group measures 35 mm while the broadest measures 95 mm. However, the dominating group is that of the tools measuring between 55 mm to 75 mm accounting for 77.77% of the scraper collecion. Thickeness of scrapers vary between 15 mm and 55 mm. Two groups ranging between 15 - 25 mm and 30 -40 mm account for 44.44% of the scraper collection.

No uniformity appears to exist between length, breadth and thickness. No set patern is observed in distribution of sizes.

(d) Borer: There are four specimens in the assemblage and account for 7% of the collection. Two specimens are made on elongated flakes. Specimen from Gedlahalli is made on a thick flake. Pointed tip, backed side, prominent mid ridge obtained by removal of flakes at steep angles are some of the noticeable features. Deep notch along the margin to produce borer point is noteworthy. These are bifacially worked and one artefact has positive bulb of percussion. This type is not noticed in other regions of Malnad. Both quartz and quartzite have been used for fashioning tools. The maximum and minimum length, breadth and thickness measure 120 mm x 70 mm x 25 mm and 71 mm x 50 mm x 25 mm respectively.

(e) Discoid: These account for 10% of the total collection. Circular in shape, most of the specimens are made employing prepared core technique. Best examples are collected from Gedlahalli. Some have zigzag edge alround due to alternate flaking and others have symmetrical margin. Prepared platform and thick mid ridge are other noteworthy points. Core as well as flakes have been preferred. These

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are bifacially worked and thick at the centre. Both quartz and quartzite are used as the rock material. The maximum length, breadth and thickness are 95 mm, 79 mm and 33 mm respectively.

(f) Point: These account for 9% of the total collection and are made on small to medium size flakes. Removal of long flakes at steep angle on the dorsal side in all the three specimes noticed at Nidaghatta resulting in prominent and almost straight mid-ridge is a noteworthy feature. In one specimen, tip is obtained by producing a notch near the top of right lateral side. Step flaking and working of bulb of percussion are other interesting features.

Table No. 18

Metrical analysis

Sl.No.	Length	Breadth	Thickness
1	90 mm	50 mm	20 mm
2	88 mm	51 mm	22 mm
3	77 mm	46 mm	21 mm
4	75 mm	40 mm	20 mm
5	60 mm	40 mm	15 mm

The average length, breadth and thickness of points measure 78 mm, 45.5 mm and 19.6 mm respectively.

(g) Cleaver(2%): It is made on an indeterminate shaped flake of brownish Quartzite. It has bi-convex cross section and thin convex working edge. Left lateral side is straight while the right lateral side is slightly wavy due to alternate flaking. Step flaking on both the surfaces and measures 9 mm in length, 51 cm in breadth and 7 mm in thickness.

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General observations: Lower Palaeolithic sites noticed in the eastern Maidan belt of central Malnad region are distinctly different from the other sites noticed in the northern Malnad along the main course of the Upper Tungabhadra both in terms of their locations as well as characterics of tool types. While the artefacts in the main valley sites are large in size and fairly rolled (reasons for rolling has already been mentioned) the tool repertoire of the central Malnad region are fresh and few and in mint condition indicating their "in situ" condition. Quartzite is the chief rock material. Use of quartz of pinkish white variety and close grained dyke are also noteworthy.

Another characteristic feature of the Lower Palaeolithic assemblage of the Malnad region is the occurrence of scraper and points predominantly in a few sites particularly in the eastern belt of the central Malnad region characterised by typical topographical features. Other noteworthy types such as blades and even borers also occur particularly in sites where Late Acheulian phase is distinctly present. These elements seem to be the forerunner of the early stages of the Middle Palaeolithic culture when compared with the findings from Anagawadi (Pappu, 1974).

In the light of the above observations of the Lower Palaeolithic sites in the whole of Malnad (particularly the eastern belt), the one noticed at Gedlahalli deserves special mention, for, it is only in this site the tools have been found away from the river valley, in the vicinity of a lake, at the foot of a granite hill. A careful examination also revealed a dried up bed of a seasonal nullah leading to nearby lake situated about 1.5 Km north-west of the hillock. The surroundings of the site is covered with grass, shrubs and thorny bushes amdist low outcrops of granite, all indicative of the semi-arid ecological features. The very location seems to suggest the assemblage being primary site in the vicinity of a lake, only one of its kind so far noticed in Karnataka.

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The tools noticed here are made on quartzite/quartz of inferior quality. What is noteworthy is that comparatively medium to small size thick fragments and occasionally flakes had been conveniently worked to the minimum to get the desired tool type. The method of flaking evidently indicates the employment of levalloisian technique liberally. The tool assemblage comprises of miniature hand axes of cordiform and triangular shapes, discoids, chopper, scrapers and points belonging to both core and flake tool groups.

Occurrence of site in the vicinity of lake is noteworthy since such sites have not been reported from other regions in Karnataka. Of course, Seshadri (1956), while commenting on the Palaeolithic tools from Kibbanahalli, opines that the tools in the area where now there is no nullah or river nearby, suggests the existence of a nullah at least in the past. Recently, Gururaja Rao and Shiva Rudrappa (1989) in the course of re-examination of this site, have postulated the possibility of existence of a lake. But now, actually there is no tank or lake nearby in the past. The discovery of Gedlahalli site evidently supports their view. Thus, there appear to be two Palaeolithic sites nearby lakes in Karnataka evident from the one in Chikmagalur area and other almost opposite to it near the eastern border of the State.

As already mentioned above, Songaon sites in the basins of Lake Victoria in Africa have yielded miniature hand axes, prepared cores and scrapers. Interestingly, similar types of tools are found in large number at Gedlahalli exhibiting levalloisian technique predominantly is noteworthy.

The lake side dwellers of Karnataka were essentially of Late Acheulian phase transforming into the Middle Palaeolithic. This is further corroborated by the Kibbanahalli evidence. Outside Karnataka, lake side site is reported from Andhra Pradesh at Guruvarajupalli at Renigunta (Murthy, 1981) where Middle Palaeolithic occupation is noticed on granitic surfaces.

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Thus, the Lower Palaeolithic assemblage of the central Malnad noticed in the Maidan belt for a seperate group by itself. Small percentage of pebble tools, appearence of large number of medium to small sized tools including miniature hand axes, more number of scraper groups, points, emergence of blade elements and preference of prepared core technique particularly at Gedlahalli are indicative of a transitional stage from the Late Acheulian to the early stages of Middle Palaeolithic culture. However, this tentative observation deserves further careful investigations on an inter-disciplinary basis.

LOWER PALAEOLITHIC SITES: THE TUNGA VALLEY

The Tunga: The river Tunga rises at a desolate spot known as Gangamula in the gloomy wilderness of the western ghats in Chikmagalur district. A stretch of 176 Kms of the river from its source till its confluence near Kudli was surveyed. Of this, about 15-20 Km stretch between Mandagadde and Gajanur is submerged in the back waters of barrage built across the river. Extensive investigations carried out in the remaining portion of the valley revealed a few Lower Palaeolithic sites viz. Pilangere, Honnapura and Harihara pura. Besides, few doubtful specimens were also collected from the pebble bed at Sringeri. However, these have not been included in the present study.

Flora: The surroundings of the upper reaches of the Tunga from Gangamula and the lower reaches upto the Gajanur barrage are covered with southern tropical wet evergreen forests, semi-evergreen forests and southern moist-deciduous forests. Beyond Gajanur along the river course, southern tropical dry-deciduous forests and southern tropical thorn forests are seen. The species of the above forest groups include Hebbalasu (Artocarpus hirsutus, Lam), Ponne, Siruponne (Colophyllun elatum, Bedd), Gobbalanerlu, Nilimara (Bischofila javanica, Blume), Halmaddi (Litseafloribunds, Goonb), Bilimatti (Terminalia peniculata), Alalekayimara (Terminalia chebula, Retz), Saguvani; Tadi (Tectona grandis, LF).

Fauna: The fauna is rich and varied. Cat, civet, mongoose, dog, bear, monkey, elephant, bison, antelope, rodent, wild boar of the mammal group; duck, eagle, hawk, kite, the jungle crow, tree pie, paraakeet, patridge, pigeon, sparrow, wood pecker of the bird group; various types of snake, crocodile and lizard of the reptile group; frog, carp, cat fish, eel of the amphibian and fish group; are well represented in this region.

Stratigraphy: Intensive survey in this river valley revealed three Lower Palaeolithic sites at Hariharapura, Honnapura and Pilangere and two Middle Palaeolithic sites at Harakere and Hoisanahalli. Details of examination of the nearby cliff section in these sites are given below. Bed rock is overlain by gravel (cemented in two localities and loose in the remaining sites) varying in thickness from 60 cm to 1 m. Over this rests sandy silt section brown or whitish in colour varying in height from 3 m to 10 m. The two cemented pebble beds at Hariharapura and Honnapura measure 20 m x 20 m. No artefact could be picked up from these beds. However, loose beds in the vicinity yield artefacts.

Similar sections in the upper reaches is noticed in localities such as Umblikere, Horabailu, Nemmar, Sringeri, Kavadi, Madagimana but devoid of pre-histroic artefacts. The sections are composed of 0 60 m to 1 m thick gravel (of loose pebbles varying in dimension) over which rests sandy silt of 1 m to 5 m height. Sections are slopy and thick forest borders the sections. From Madagimana upto Mandagadde, the sections are of whitish sandy silt of 4-5 m height covered with patches of thick forest. From Gajanur upto Kudli where the river joins the Bhadra, cliff sections exhibit uniform feature. Over the bed rock is seen reddish silt deposit varying in height from 3 m to 10 m. In this stretch of the river, few loose pebble beds noticed at Harakere, Pilangere and Hoisanahalli are composed of quazite pebbles of varying dimension coated with a thin layer of brownish patina. The

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largest pebble beds are noticed at Harihara pura and Honnapura measuring on an average 250 m north-south x 50 m east-west. Occurrence of oyster shell near the cemented gravel at Harihara pura is noteworthy (vide appendix no.). Couple of Mesolithic sites and Neolithic habitation sites also occur near the Lower Palaeolithic sites, a feature already observed in the Upper Tungabhadra valley indicating continuation of human habitation.

From the above survey, the following stratigraphy is reconstructed (from top to bottom).

a) White or red silt (mixed with fine sand) 1 m to 10 m in height,
b) Loose pebbly gravel (cemented gravel in two localities).
c) Bed rock (schist-gneiss).

Environment: Environmental condition of the Lower Palaeolithic sites in the region are varied. All sites are found in the river bed under two different geographical limits. Occurrence of a solitary site amidst thick forest indicate that the Palaeolithic man occasionally ventured to live in rugged terrains of the region because most of the sites occur in the lower reaches characterised by less rain fall, shallow waters in the river and semi-deciduous forests. This is a common feature in the region under study.

Rock material: Quartzite is the most favoured rock material. It is brownish and close grained. Thin layer of blackish patina on them is noteworthy.

The Lower Palaeoliths: The Lower Palaeolithic artefacts retrieved from the loose pebbly gravel at Honnapura and Pilangere have been discussed below. A lone hand axe from Harihara pura site has not been included in the analysis.

Table No. 19

Typological distribution of Artefacts

Sl. No	Tool Type	Honnapura	Pilangere	Total
1	Chopper	-	1	1
2	Hand axe	1	4	5
3	Discoid	1	1	2
4	Cleaver	1	-	1
5	Scraper	1	-	1

On typo-technological basis, these are further divided into the following three groups.

Table No. 20

Core and Flake groups

Sl. No	Grooup	Tool type	No.	Percentage
1	Pebble tool	Chopper	1	10%
2.	Core tool	Hand axe discoid	4	40%
3	Flake tool	Hand axe Scraper Cleaver	5	50%

Pebble tool group: Unifacial chopper accounts for 10% of the total collection. The lone specimen having a thin coat of blackish patina is flaked from one direction. Numerous shallow step flake scars indicate advanced technique. The specimen having convex cutting edge is fashioned on a roundish quartzite pebble measuring 70 cm x 25 cm x 8 cm.

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Core tool group: Two types of tools belong to this category: (1) Hand axes and (2) Discoids.

Hand axe (40%): As already noticed, these, fashioned on quartzite pebbles, are bifacially worked. Mid rib is prominent in one while the other one is flat on both the sides. Tip is pointed and both have wavy periphery attained by alternate flaking. Artefacts are rolled and have biconvex cross section indicating Acheulian characters.

Discoid (20%): One each from the two sites were picked. Both are made on pebbles of medium size. Bifacially worked, having four to six flake scars and the zigzag outline suggests the use of alternate flaking. The artefacts are in semi-rolled condition. Shape is almost sub-triangular, thick at the centre.

Flake tool group: This category comprising three tool types, viz. (a) Hand axe, (b) Cleaver and (c) Scrapers, constitute 50% of the total collection. All the five specimens made on flakes detached from large pebbles were picked up from the loose pebbly gravel bed.

(a) Hand axe: These are fashioned on slightly thicker flakes, constituting 30% of the total collection. Two are of medium size and the third one is comparatively big. These are bifacially worked and exhibit 4 - 6 shallow flake scars. Mid rib is prominent. Two specimens exhibit pointed tip. One is beak like. The tip is achieved by removing a flake at steep angle near the top. Two specimens exhibit faceted platform. Bulb of percussion is prominent. Outline is wavy in two specimens while the third one is fairly straight. Artefacts devoid of secondary retouch indicate the early Acheulian character. Two are triangular and the third one is oval in shape. Stone hammer technique sems to have been employed for fashioning these artefacts made on quartzite.

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(b) Cleaver: The solitary cleaver made on a side flake has two faceted platforms. It is roughly 'U' shaped. Profile on both the sides is straight. Working on the surface is limited. Butt end has been achieved by removing two large flakes at steep angle on either side. No retouching. Biconvex section at the middle. Blackish patina is noteworthy. Stone hammer technique seems to have been employed to fashion the tool made on Quartzite.

(c) Scraper· The lone scraper almost triangular in shape is made on a primary flake. Its left lateral side is curved so as to form a beak like tip, a rare feature found in this region. The working end is thin. 3-4 flake scars are distinctly visible on the dorsal side. Its maximum length is 130 mm.

Table No. 21

Metrical analysis of Hand axe group

Sl. No.	Length	Breadth	Thickness
1	80 mm	70 mm	40 mm
2	100 mm	80 mm	45 mm
3	105 mm	70 mm	50 mm
4	110 mm	77 mm	45 mm
5	140 mm	95 mm	30 mm

As can be seen from the above analysis, artefacts ranging between 100 mm - 110 mm account for 60% maximum being 140 mm. Breadthwise also, specimens ranging between 70 - 80 mm dominate with 80%, maximum breadth being 95 mm. Thicknesswise, 60% of the specimens ranging between 40 mm - 45 m dominate.

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As the percentage of artefacts are very meagre, it is difficult to ascertain the standard pattern adopted for manufacturing hand axes in the Tunga valley. Further work in this field may throw more light on this aspect.

General observations: Lower Palaeolithic industry of the Tunga valley is represented by all the known tool types of this culture. The number of artefacts, though limited, suggest the presence of pre-historic people in the region. The artefacts picked up from the loose pebbly gravel bed exhibit an admixture of pebble tool and hand axe-cleaver groups. Pebble tool group is represented by only unifacial chopper. Majority of the hand axes made on flake have pointed tip. Hand axe with beaked projection or tip is a noteworthy feature common to the sites in the region under study. Occurrence of cleaver is important as this type is not found in the adjacent Upper Tungabhadra and Bhadra valleys. Discoids and scrapers also occur. From the point of view of flaking technique employed for fashioning the tools, the entire assemblage can be associated with middle Acheulian stage. Quartzite is the most favoured rock material.

In the absence of evidences supporting the location of factory sites in the vicinity of gravel beds or in the surrounding area away from the river bed, it may be presumably concluded that the exposed pebble beds were used for fashioning tools as and when required.

LOWER PALAEOLITHIC SITES : THE BHADRA VALLEY

The Bhadra: The river Bhadra rises in the western ghats at Gangamula and changes its direction frequently. It forms the main water shed of the central and eastern limits of Chikmagalur and Shimoga districts respectively. Investigations in 155 Kms stretch of the river revealed Palaeolithic sites at Kagganahalla, Balehonnur, Khandya,

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Shankaraghatta, Sompura, Sidhlipura, Dodgopenahalli, Barandur; Mesolithic sites at Bommanakatte, Kagikodumagge, Dasara Kallahalli and a Neolithic site at Mattighatta. Cliff sections of the river were also examined at regular points to ascertain the stratigraphy. About 50 Kms stretch of the river could not be surveyed as it is submerged in the back waters of the dam built across the river at Lakkavalli.

Flora: The upper reaches of the Bhadra river is covered with evergreeen forests. Nilimara (Bischofia Javanica Bl.,), Kaidhupa (canarium strictum Roxb.,), N Burm (Mesua nagassarium) are some of the important species. The region in the middle course of the river accommodates wet deciduous and semi-evergreen forests. Bilimatti (Terminalia peniculata), Nauladi (Vitex altissima L.F.), Haldina (Cordifolia Roxb) are some of the useful trees. In the lower reaches from Lakkavalli down upto Kudli, the region falls under dry deciduous and thorn scrub belt. Alale (Terminalia chebula Retz.), Tare (Terminalia bellerica, Roxb.), Saguvani (Tectona grandis, Linn.F.) are some of the common trees in the region. In the Lakkavalli region, extensive bamboo brakes is also seen. Deciduous trees are replaced by throny trees and shrubs as the area becomes drier in the lower course of the river.

Fauna: On account of varied forest belt, the fauna of the region is very rich. Tiger, leopard of the cat family, civet, mongoose, hyena, members of the dog family, bear, otter, bat, elephant, bison, deer family, rodent, boar, Indian pangolin of the mammal group; heron, stork, duck, teal, eagle, hawk, kite, owl, tree pie, jungle crow, tit, parakeet, pigeon, patridge, sparrow, wild dove, cuckoo, bulbul of the bird group; snake, lizard, crocodile of the reptile group; varieties of frog of the amphibian group; carp, cat fish, murrel, eel of the fish group and other domestic animals are well represented in this region.

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Stratigraphy: As already mentioned above, except for about 50 km stretch of the river submerged in the back waters of the Lakkavalli dam; the remaining stretch from its source upto Hebbe and the area between Lakkavalli and Kudli where it merges with the Tunga; cliff sections revealing the following stratigraphy were examined.

In the Palaeolithic sites at Kagganahalla, Balehonnur, Sompura, Sidhlipura, Dodgopenahalli and Barandur, the cliff sections composed of loose pebbly gravel of 60 cms to 1 m thickness, probably resting on bed rock, overimposed by a thick deposit of silt of white or brown to reddish in colour varying in height from 2 m to 10 m were noticed. Similar stratigraphy in the upper course is observed in the sections at Ambatirtha, Kalasa, Bannur, etc but devoid of pre-historic tools. The largest pebble bed in the region at Bannur measures 100 m north-south x 20 m east-west. In the upstream where the river traverses through typical Maland belt, the river sections are covered by thick forest and in the Maidan area, deciduous Savana like features are noticeable.

Environment: Palaeolithic sites in the region under study occur in two distinctly different geographic situations. pebble tools of Acheulean character retrieved from Kagganahalla, pebble bed in the upper reaches situated amdist the thick forested area and rugged terrain of western ghats with heavy rain fall may indicate that Palaeolithic people also preferred to live under tuff conditions. But this seems to be a solitary case since most of the sites in the region are located in the lower reaches where the shallow river and Savana type vegetation offered congenial condition for living. In the adjacent river valleys also, sites are found in similar geographical conditions.

The Lower Palaeoliths: Explorations conducted in the Bhadra Basin, from its origin till its confluence with the Tunga at Kudli, revealed as many as seven sites having Lower Palaeolithic appendage distributed at various points. A solitary site situated at a higher level about 2 Km away from the river bed has also been included along with the above mentioned seven sites for discussions in the following pages (Table 22).

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Table No. 22

Typological distribution and frequency of Lower Palaeolithic tools in the Bhadra valley

Tool types	Sites								Total
	Barandur	Dodgopenahalli	Sidhlipura	Sompura	Shankaraghatta	Balehonnur	Khandya	Kagganahalla	
Unifacial Chopper	1	-	-	-	-	-	-	1	2
Bifacial Chopper	-	1	1	-	-	-	-	-	2
Hand axe on core	1	2	-	2	1	1	-	1	8
Hand axe on flake	2	1	1	-	1	-	-	-	5
Scraper on core	-	-	1	-	-	-	-	-	1
Scraper on flake	2	1	3	-	-	1	1	-	8
Discoid	-	-	-	-	-	-	1	-	1
Total									27
Total percentage	23%	19%	23%	7%	7%	7%	7%	7%	100%

As usual, the Lower Palaeolithic assemblage in the Bhadra valley is also characterised by pebble, core and flake tools. The pebble group includes unifacially and bifacially worked choppers. These were picked up from four sites, namely, (1) Kagganahalla, (2) Sidhlipura, (3) Dodgopenahalli and (4) Barandur.

Pebble tools constitute 14.81% of the total collection. The four artefacts of this group comprises of two unifacial choppers having flake scars on one side made on trap quartzite and two bifacial choppers with working on both the sides both made on quartzite.

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Specimens from Kagganahalla, Dodgopenahalli and Barandur are fresh and have clear flake scars, exhibiting insitu condition. The fourth specimen from Sidhlipura is slightly rolled probably due to movement within the pebble bed particularly during heavy floods.

Table No. 23

Site-wise occurrence of Pebble tools in the Bhadra valley

Sl. No.	Site	Tool type	Rock material
1.	Barandur	Unifacial chopper	Quartzite(Brownish)
2.	Dodgopenahalli	Bifacial chopper	-do-
3.	Sidhlipura	-do-	-do-
4.	Kagganahalla	Unifacial chopper	Trap

Shallow flaking confined to both the ends are directed from base upwards, resulting in scar dipping at steeper angles varying from 60° to 80°. Cortex is retained. Symmetrical convex working edge and biconvex cross section are seen. Semi-fresh; one artefact has a pointed tip.

Table No. 24

Metrical analysis of Pebble tools

Sl. No.	Length	Breadth	Thickness
1	115 mm	89 mm	40 mm
2	105 mm	90 mm	45 mm
3	95 mm	85 mm	50 mm
4	100 mm	95 mm	50 mm

All the artefacts are proportionate to one another in measurement indicating uniformity in size.

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Core and flake industries: Tool types of this group in the Bhadra valley comprises of hand axes, scrapers (with sub-types) and discoids. No cleaver could be picked up from the sites.

Hand axes constitute the major portion of the assemblage with 48.15% of the total collection. Of these, 61.46% are made on core and 38.46% are made on flake. The common shapes met with are as follows:

Table No. 25

Classification of shapes

Sl. No.	Shape	Total No.	Percentage
1	Triangular	4	31%
2	Oval	4	31%
3	Pear shaped	3	23%
4	Almond	2	15%
	Total ...	13	100%

Hand axe on core: In this group, eight hand axes are made on pebbles of medium size. Of these, four exhibit cortex partially or fully on one side and the remaining four are fully flaked. Though semi-rolled, flake scars on them detached at steep angle of 60° to 80° are still clearly visible. Deep flaking and zigzag working edge in artefacts from Sompura exhibit abbevelian features. However, remaining types from sites such as Dodgopenahalli and Shankaraghatta have symmetrical edge. Thin pointed tip in them is noteworthy. Hand axe from Barandur has prominent negative bulb of percussion. The specimens of different forms are thick at the middle.

Hand axe on flake: Hand axes of this category 18.51% of the total collection) are made on large flakes detached from pebbles. These are bifacially worked and are in semi-rolled condition. Trinagular and

pear shaped Hand axes are commonly met with. Hand axes are characterised by shallow flake scars, symmetrical working edge and step flaking. Deliberate notch near the tip on the right ventral side is a noteworthy feature. Two artefacts have faceted platforms. Couple of artefacts are retouched marginally. All the artefacts have pointed tip. In fact, one Hand axe with beaked point resembles similar specimens reported from Kibbanahalli (Seshadri, 1956) and from Upper Krishna basin (Pappu, 1974). Notches near the lateral ends may also indicate hafting. Artefacts found in streams are more refined indicating late Acheulean characters. Hand axes with biconvex cross section are more preferred followed by triangular sectioned axes as is evident from the following table.

Table No. 26

Cross sections of Hand axes: Bhadra valley

Sl No.	Cross section	Nos.
1	Plano-convex	3
2	Bi-convex	5
3	Triangular	4
4	Trapezoidal	1

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Table No. 27

Metrical analysis of Hand axe group

Sl. No.	Mexımum Length	Maxımum Breadth	Maxımum Thıckness
1	85 mm	55 mm	50 mm
2	90 mm	70 mm	25 mm
3	95 mm	70 mm	60 mm
4	105 mm	70 mm	45 mm
5	110 mm	75 mm	50 mm
6	110 mm	90 mm	50 mm
7	110 mm	90 mm	40 mm
8	115 mm	60 mm	30 mm
9	115 mm	80 mm	50 mm
10	120 mm	90 mm	35 mm
11	126 mm	95 mm	45 mm
12	145 mm	80 mm	50 mm
13	152 mm	80 mm	30 mm

Variatıon range ıs too great as ıs evıdent from the above analysıs. The smallest one measures 85 mm ın length whıle the longest one measures 152 mm in length. In fact, the smallest hand axe ıs the most uncommon ın the collectıon. Specımens rangıng between 105 mm to 115 mm (6 Nos.) account for 46.15% of the total collectıon; followed by tools ranging between 120 mm to 152 mm (37.69%) numberıng four. Remainıng three spcımens fall wıthın the range of 85 mm to 95 mm accountıng for 23.76% of the total collectıon.

Breadthwıse, the narrowest ıs 55 mm and the broadest is 95 mm. However, tools rangıng between 95-90 and 75-70 account for 4 Nos. each (37.69%) and the remainıng fıve specımens fall ın 80 mm (23.75%) and 55-60 mm (15.38%) ranges.

Variations ranging between 25 mm to 60 mm in the thickness is also noteworthy.

Technique: Stone hammer is the most common technique employed for fashioning tools. Secondary retouching of the working edge in some of the tools also indicate the use of cylindrical hammer technique. Specimen from Sompura exhibiting deep flake scars and the zigzag working end are devoid of secondary retouch work and indicate abbevelian feature. Artefacts from Shankaraghatta, though small in length, have all the characteristic features of advanced acheulian technique. The whole assemblage of the Bhadra valley on the basis of typo-technology can be attributed to abbevellio-acheulian to late acheulian.

Discoid: The solitary discoid made on quartzite flake is bifacially worked. Outline is zigzag exhibiting alternate flaking and thick at the centre. Semi-rolled.

Scraper: The scrapers retrieved from four sites are divided into two categories.

(a) Scrapers made on core (9.21%)

(b) Scrapers made on flakes (88.88%)

The lone specimen of the first category made on a thick quartzite flake is rather crude. 3 to 4 flake scars are seen on both the surfaces. Zigzag left margin indicates alternate flaking. Tip is pointed.

Scrapers made on flakes account for 88.88% of the total collection. The following sub-types on the basis of working are noticeable.

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Table No. 28

Classification of scrapers

Sl. No.	Tool type	Total No
1	Side scraper	3
2	Side scraper cum point	1
3	Double sided scraper	3
4	Double sided scraper cum point	1

Among the eight scrapers, six are bifacially worked and the remaining are worked on one side. None of the artefacts exhibits retouching of margins. Faceted platform is observed in a couple of scrapers. Occurrence of levalloisian flakes with prominent bulb of percussion is noteworthy. Double sided scrapers have thick mid-rib. Few scrapers having pointed tip is another important feature. Triangular, oval and rectangular are the common shapes met with. 77.77% of the scrapers have triangular cross section and 22.22% have bi-convex section. Scrapers made on quartzite are fashioned using stone hammer and levalloisian techniques.

Table No. 29

Metrical analysis of scraper group

Sl. No.	Length	Breadth	Thickness
1	80 mm	40 mm	25 mm
2	81 mm	70 mm	50 mm
3	85 mm	65 mm	30 mm
4	95 mm	65 mm	28 mm
5	100 mm	55 mm	40 mm
6	100 mm	70 mm	20 mm
7	100 mm	80 mm	30 mm
8	115 mm	80 mm	30 mm
9	115 mm	80 mm	55 mm

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It is evident from the above table that lengthwise, specimens ranging between 100 mm - 115 mm (55.55%) dominate followed by those ranging between 80 mm - 95 mm (44.44%) Breadthwise, artefacts ranging between 65 mm - 75 mm with 55.55% dominate followed by 40 mm - 55 mm range. Thicknesswise, scrapers ranging between 30 mm - 40 mm (44.44%) are the dominant group. The minimum and maximum thickness is 20 mm and 55 mm respectively.

General observations: Intensive survey of the Bhadra valley has revealed moderate number of Lower Palaeolithic sites. As already mentioned above, the river Bhadra travels both in the Malnad and Maidan belts of the region. Interestingly, sites are located in different geographical settings in the valley. The percentage of artefacts in these sites is limited. However, all important types such as pebble choppers, hand axes, scrapers occur. Absence of cleaver in the group is noteworthy. Majority of the artefacts are made on river borne quartzite pebble, available in plenty in the river bed. However, pebble tools made on volcanic trap noticed at Kagganahalli in the Upper Bhadra valley deserve attention for, this is the only site in southern Karnataka where use of volcanic rock is reported. Although artefacts (hand axes) from Sompura exhibit abbevelian feature both in type as well as technology, other tool repertoire reported from different sites show the employment of advanced acheulian technique. Occurrence of levalloisian flakes is also noteworthy. Hand axes having pointed tips as well as notches in the lateral margins probably for hafting deserve attention.

Thus, it is clear from the above features that the site noticed in this valley are similar to adjacent valleys both in their geographical distribution pattern as well as in typo-technological aspects of the culture.

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LOWER PALAEOLITHIC SITES: THE HEMAVATI VALLEY

The Hemavati: Hemavati, also called Yennehole, is one of the major tributaries of the river Kaveri. It rises at Devanasi hills (1090 m MSL) in the western ghats in Mudigere taluk of Chikmagalur district and flows to a distance of 200 Kms before joining Kaveri near Krishnarajasagara. Intensive archaeological survey conducted in about 110 Kms stretch in two districts of Chikmagalur and Hassan revealed Lower Palaeolithic, Middle Palaeolithic, Mesolithic and Megalithic sites. About 50 Kms stretch between Gorur and Sakleshpura, submerged in the back waters of Gorur dam across the Hemavati could not be included in the survey.

Flora: The region in the upper reaches of the river accommodates tropical evergreen forests. Hebbalasu (Artocarpus hirsu Lam.,), Dhuma (Diptero carpus indicus Bedd), Balpale (Lophopetalum wightianum Arn), Halmaddi (Litsea floribunds Gamb) are some of the common trees. The middle course of the region has semi-evergreen and wet deciduous forests with Aduva (Celtis tetrandra Roxb), Miarole; Neraladimara (vitex altissima L.F.) and other types of trees. In the easten limits of the river course, the region has dry deciduous and thorn scrub forests. Saguvani; Jadi (Tectona grandis L.F.), Shantimara (Terminalia billerica [Gaertn.] Roxb.), Gandha; Srigandha (Santalum album 2.), Honne (Pterocarpus marsupium Roxb) are some of the trees commonly met with in the region. Besides, the region is infested with interested acquatic flora also.

Fauna: The fauna of the region is rich and varied on account of the three forest types, namely, tropical semi-evergreen, tropical moist and sub-tropical wet forests. The mammal group is well represented by ciret, mongoose, dog, bear, deer, otter, antilope, etc. The bird group is represented by about two hundred and fifty species. These include birds of prey, migratory nature and perching birds. Other bird types include parrot, king fisher, hornbill, wood pecker, etc. Among the reptile group, there are as many as thirtyfive species of snakes.

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Stratigraphy: In the upper reaches, almost near the source, occurrence of a Lower Palaeolithic site is noteworthy. In the lower reaches, Lower Palaeolithic artefact could be picked up only at Kattebelguli which incidentally is also a prolific Middle Palaeolithic site. Down stream from Kattebalguli, two Middle Palaeolithic sites at Kattehosalli and Cholenahalli and two Mesolithic sites at Mudalahippe and Maranayakanahalli occur right on the river bank, a feature uncommon in other valleys of the region under study.

Two distinct stratigrapy is observed in these sites. At Kattebelguli, bed rock (Holenarasipur Gneiss?) is overlain by cemented pebble bed of 0.90 cm height over which rests a 25 cm thick brownish clay which in turn is superimposed by a loose kankarised gravel bed of 0.70 m height. Above this gravel is 2 m thick sandy brownish silt. Though similar stratigraphy is noticed at Kattehosalli about 3 Kms down stream from Kattebelguli, the thickness of deposits vary considerably. The stratigraphy of the sections in the second group of sites at Holenarsipur, Cholenahalli, Mudalahippe and Maranayakanahalli are almost uniform. Over the bed rock is loose pebbly ravel of 60 cm to 90 cm thickness on which rests 40 cm to 80 cm thick sand deposit which in turn is overlain by 2 - 4 m thick brownish silt. However, the above stratigraphy is conspicuously absent in Bankal and Ramagattu where over the bed rock is 60 cm to 90 cm thick pebbly gravel which is covered by a 1 m to 2 m thick brownish Silt. In the upper reaches, most part of the river section is composed of 2 - 5 m thick whitish sandy silt. Cemented pebble bed is also observed at Nagaratti (in Hassan district limits) where the river enters the adjacent Mysore district.

From the above survey, the following two different stratigraphy is reconstructed (from top to bottom).

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Kattebelguli	Mudalahippe
a) Brownish sandy silt	a) Brownish silt
b) Loose kankarised gravel bed	b) Sand
c) Brownish clay?	c) Loose pebble gravel
d) Cemented gravel	d) Bed rock
e) Bed rock	

Environment: Environmental conditions seem to be almost similar to the conditions prevailed in the other valleys of the region under study. Occurrence of a lone Acheulian site in the thick forest known for heavy rain fall is noteworthy. The lower reaches of the valley characterised by semi-deciduous forests and shallow water seem to have favoured Palaeolithic and Mesolithic men since majority of the sites found are of these cultures.

Rock material: Lower Palaeoliths retrieved from Bankal pebble bed are made on quartz of brownish colour containing grains of white mica. This rock is probably derived from the quartz veins of schist belt in the region. A lone hand axe from Kattebelguli is made on quartz of brownish colour, a rare feature found in this valley.

The Lower Palaeoliths

As already mentioned above, the two Lower Palaeolithic sites noticed in the valley together yielded only 6 artefacts. The collection include choppers and hand axes. Typological distribution of the tools are given below in the table.

Table No. 30

Typological distribution of artefacts

Site	Chopper	Hand axe	Total
a) Bankal	3	2	5
b) Kattebelguli	-	1	1

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The assemblage may be divided into two groups as follows·

Table No. 31

Sl. No.	Arte fact	Tool type	Percentage
1	Core tools	Chopper 2 Hand axe 2	66.66%
2	Flake tools	Hand axe 2	33.33%

Core tools: There are two types of artefacts, viz. (1) choppers and (2) hand axes.

Chopper: These are made on quartz pebbles of brown colour. Five to six step flake scars are found on both the dorsal and ventral sides besides the uneven butt and deep flake scars. Zigzag convex cutting edge with a tendency to have a pointed tip. Butt portion is uneven and both specimens exhibit deep flake scar. The semi-rolled condition is probably due to movement within the pebble bed.

Hand axe: Two hand axes in the assemblage are made on core. They account for 50% of core tool collection. Both the specimens are fashioned on quartz pebbles of pinkish white colour. Step flaking on both the surfaces; straight prominent mid-ridge, thick at the centre. One is cordiform and the other one is sub-triangular. The former has zigzag working edge due to alternate flaking while the latter exhibits secondary retouch near the periphery to obtain straight working edge. Cross section is biconvex; thin roundish tip is observed in one hand axe while the other has cleaver like thin cutting edge near the tip. Stone hammer technique, it seems, employed to fashion these artefacts found in semi-rolled condition.

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Flake tools: This category is represented by two artefacts: (a) Ovate and (b) Double pointed oval shaped hand axe. Both the specimens are made on flakes detached from the thick sectioned flakes from quartz pebbles of brown and white colour respectively. These account for 33.33% of the total collection. Double pointed hand axe exhibit as many as three striking platforms indicating that it is made on a side flake. Mid ridge is semi-curved, periphery is wavy due to alternate flaking. Ovate hand axe exhibits large shallow flake scars and its under-surface is not worked at all. Periphery is made almost straight by retouching. Calcarious material is sticking to the specimen and the fresh condition suggests its 'insitu' deposition in the cemented bed. Both the artefacts indicate the employment of stone hammer and cylindrical hammer techniques.

Table No. 32

Metrical analysis of Hand axe group

Since the collection is very meagre, actual measurements have been given below:

Sl.No.	Maximum length	Maximum breadth	Maximum thickness
1	100 mm	100 mm	50 mm
2	125 mm	105 mm	60 mm
3	150 mm	80 mm	30 mm
4	165 mm	132 mm	50 mm

As can be seen from the measurements of the four specimens, there is no inter-relationship between length, breadth and thickness. Dimensions also indicate that the specimens are of medium size. The average length, breadth and thickness being 131.77 mm, 104 mm and 47.50 mm respectively.

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General observations: Investigations in the Hemavati basin has thrown light on the pre-historic potentiality of the region. Lower Palaeolithic phase in the Hemavati valley is now known by the presence of chopper - hand axe industry. Location of the Lower Palaeolithic site almost near the origin of the river in the thick forest area is particularly noteworthy. All the specimens are from the gravel bed. In the chopper group, unifacial chopper is absent, while in the flake tool group, except the hand axes, other tool types of the Lower Palaeolithic phase such as cleaver, scraper, discoid, etc. are not traced. However, their occurrence can not be ruled out.

All specimens exhibit step flaking. Some specimens exhibit alternate flaking while some are retouched along the periphery thereby indicating Acheulian character of the assemblage. Stone hammer and cylindrical hammer techniques have been employed liberally to fashion the tools.

Although specimens available in the collection are very meagre, they exhibit close similarity to the assemblages noticed elsewhere in the adjacent valleys of the same region. The double pointed hand axe is a rare type in the entire region. However, such types are reported from the Malaprabha basin in northern Karnataka (Joshi, 1956).

Detailed description of select tool types is given at the end of the chapter.

LOWER PALAEOLITHIC SITES : THE KAVERI VALLEY

The Kaveri: This principal river forms the southern most drainage system of the region under study. Rising in the western ghats in Coorg district, it flows in its eastward course beyond the borders of Coorg into Hassan district where it traverses for a distance of 30 Kms before entering the adjacent Mysore district. Investigations in this stretch of the river in Hassan district revealed Palaeolithic and Megalithic

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sites scattered between Kaduvina Hosalli upto Keralapura. Geologically, the region under study is of granitic complex although major portion of Hassan district is covered by schist.

Flora: The region subjected to investigation is covered by dry deciduous and thorny scrub forests. Alalekayimara, Hardekayimara (Terminalia chebula retz), Shantimara (Terminalia bellirica (Gaertn Roxb), Saguvani; Tadi (Tectona Grandis L.F), Bandre (Dodonaea viscosa Jocq) are some of the species of trees in the region. Besides, a rich acquatic flora and soft wood species are also found in the region. Rain fall in the region varies between 300 mm to 600 mm.

Fauna: Hyena, mongoose, cat, bear, deer, fox, jackal, bat and rodent of the mammal group; prey, eagle, hawk, buzzard, kite and vulture, pigeon, dove, patridge, fowl, bulbu, babbler, shrite of the bird group; snakes of various species of reptile group are well represented in the region under study.

Stratigraphy: Examination of sections in sites yielding Lower Palaeolithic sites at Konanur and Rudrapatna revealed the following sequence. Over the bed rock(?) is 60 - 90 cm thick loose pebbly gravel which is overlain by a thick deposit of brownish clayee silt varying in height from 1 m to 3 m. Similar sections devoid of lithic tools are seen at Kattepura, Basavanahalli and near Ramanathapura where cemented gravel bed of 60 cm to 90 cm is overlain by a thick brownish clayee silt deposit of 1 to 2 m height. In other sites, cliff sections are exclusively composed of brownish silt rising in height from 2 m to 4 m. The largest pebble bed in the entire stretch of 30 Km is noticed at Rudrapatna measuring about 100 m north-south x 300 m east-west.

The following sequence is reconstructed from top to bottom.

(a) Brownish silt (b) Loose pebbly gravel (cemented gravel in some localities but devoid of lithic artefacts) (c) Bed rock(?)

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Environment: The environmental conditions does not seem to have been much different from the conditions that prevailed in the adjacent valleys in the region, viz. Hemavati, Bhadra, etc.

Rock material: Geologically the region under study falls within the Gneiss complex. quartzite and jasper are the two types of rock material used for fashioning tools. Occurrence of tools of jasper is a rare feature obsrved in the region. It is brown in colour and contains micro-crystalline quartz. A unifacial chopper and a side scraper are made on this rock. Hand axes and other types of tools prepared on quartzite is also noteworthy.

The Lower Palaeoliths

Intensive survey of small stretch of 30 Km of Upper Kaveri basin in the Hassan district revealed two Lower Palaeolithic sites and a few Megalithic sites. Locations and other features of these sites have been described in the preceeding chapter.

The Lower Palaeolithic tools belong to two groups, viz. (1) Core tools and (2) Flake tools as illustrated below.

Table No. 33

Typological distribution of Lower Palaeolithic tool types in the Upper Kaveri valley

Sl. No.	Tool type	Konanur	Rudrapatna	Location
1	Chopper	-	1	Loose Pebbly gravel bed
2	Hand axe	1	2	-do-
3	Discoid	1	-	-do-
4	Side Scraper	-	1	-do-
5	End Scraper	-	2	-do-
		2 +	6 = 8	

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Table No. 34

Distribution pattern of core and flake tools

Sl. No.	Tool type	Core	Flake	Total	Percentage
1	Chopper	1	-	1	12.5
2	Hand axe	-	3	3	37.5
3	Discoid	1	-	1	12.5
4	Side scraper	-	1	1	12.5
5	End scraper	1	1	2	25.0

As is evident from the above chart, flake tools account for 62.5% followed by core tools accounting for 37.5% of the total collection.

(1) Core tool group comprises of bifacial chopper, discoid and one end scraper.

Chopper: The lone chopper in the collection is made on a jasper pebble of medium size. The working end is achieved by alternate flaking, cortex portion is thick and roundish.

Discoid: It is worked bifacially on a medium size pebble. It is circular in shape. Working end is achieved by alternate flaking. Thick at the centre and fresh.

End scraper: End scraper is made on an irregular lump. Though rolled, thin and long flake scars are seen all over. Zigzag working end obtained by alternate flaking.

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Table No. 34(a)

Metrical analysis of Core tool group

Sl. No.	Tool type	Maximum Length	Maximum Breadth	Maximum Thickness
1	Chopper	85 mm	70 mm	50 mm
2	Discoid	80 mm	75 mm	60 mm
3	End Scraper	85 mm	70 mm	50 mm

To understand the metrical character of these groups, further work in the region may be necessary.

(2) Flake tool group of the Upper Kaveri constitutes 62.5% of the total collection and comprises of two categories, namely (a) Hand axes and (b) Scrapers.

Hand axes made on thick flakes obtained from pebbles are of three forms viz. oval, pear and triangular. These are picked up from the loose pebble bed at Konanur and Rudrapatna. Two hand axes are bifacially worked and the third one is worked on the dorsal side. Flake scars vary in number from 5 to 8 on surface. Steps on these artefacts are due to the cleavage in the rock. Marginal retouch is limited. They are thick at the middle with prominent mid rib. Biconvex in cross section and have almost symmetrical periphery. A deliberate notch near the top on the right lateral side of the triangular hand axe appearing like a beak shaped projection is a noteworthy typological feature. Tip is retouched in the other two Hand axes.

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Taole No. 34(b)

Metrical analysis of Hand axes

Sl. No.	Tool type	Maximum Length	Maximum Breadth	Maximum Thickness
1	Oval shaped Hand axe	115 mm	85 mm	50 mm
2	Pear snaped Hand axe	130 mm	75 mm	50 mm
3	Triangular Hand axe	145 mm	105 mm	45 mm

As is evident, variation in length and breadth is noticeable while the thickness of the artefacts seem to be almost uniform. The average length, breadth and thickness measure 130 cms, 89 cms and 49 cms respectively.

Scraper: One is a side scraper and the other is an end scraper. Both are slightly rolled. Side scraper is fashioned on a thick Levalloisian flake. Flakes at steep angle have been detached from the left lateral side, has zigzag working end and faceted platform. It is rather thick at the centre and the mid rib is prominent.

End scraper made on a small flake has shallow bladish flake scars. Secondary retouch near the working end on the dorsal and ventral sides is noteworthy. It is almost circular in shape. Pebble cortex is retained on the ventral side.

Table No. 34(c)

Maximum measurement of Scrapers

Sl. No.	Tool type	Length	Breadth	Thickness
1	Side Scraper	120 mm	90 mm	30 mm
2	End Scraper	75 mm	65 mm	25 mm

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Technique: Shallow flake scars on the flake tools and the flaking marks on the solitary bifacial chopper indicate the use of stone hammer technique. Secondary retouch done on the oval shaped hand axe and end scrapers suggests employing of cylinder hammer technique. Couple of flakes exhibit the use of levalloisian technique also.

General observations: As already noticed, cleaver is absent in the tool repertoire of this valley also. Tools are bifacially worked. Hand axes constitute the major group (37.5%) followed by scrapers. Flakes show evidence of faceted platform. By and large, the flake assemblage exhibit improved skill of stone tool manufacture. Stone hammer and cylindrical hammer techniques used to detach flakes and for retouching respectively suggest that Upper Kaveri assemblage essentially belongs to the acheulian industry.

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LOWER PALAEOLITHIC TOOL TYPES

Figure I · Unifacial choppers

(1)

River valley: Bhadra Site: Barandur

Rock material: Quartzite Tool type: Unifacial chopper

Description: Medium sized, convex edge, oval in shape having flat base; pointed tip attained by removing shallow flakes on either side of the convex edge at the centre. Deep flake scars: Semi-circular butt. Measures 11.5 x 8.9 x 4 cm.

Comparable to· No.8of Fig. No. 13 of Anagawadi (Pappu, 1974).

(2)

River valley : Bhadra Site: Kagganahalla

Rock material: Volcanic trap Tool type· Unifacial chopper

Description: Made on almond shaped brownish pebble; convex working edge. Shallow flake scars inclined towards the edge. Flat butt. Semi-rolled. Measures 10 x 9.5 x 5 cm.

Comparable to: No. 9, Fig. 13, Upper Krishna (Pappu, 1974)

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(3)

River valley : Tunga Site: Pilangere
Rock material: Quartzite Tool type· Unifacial chopper

Description: Made on a round bottomed pebble. Shallow flaking towards the working end on the dorsal side. Few steps are noticeable. Convex working end. Black patina on the cortex. Semi-rolled. Measures 8.5 x 10 x 4 cm.

Comparable to: No. 1, Fig. 20, Veddulacheruvu (Vidula Jayaswal, 1982).

(4)

River valley : Upper Tungabhadra Site· Nyamti
Rock material: Quartzite Tool type· Unifacial chopper

Description: It is made on a pebble with round bottom. Whitish cortex. Three deep and bold flakes removed on the dorsal side. Ventral side has uneven surface. Convex working edge. Inferior quality of the material resulting in uneven flaking and multiple fractures. Measures 9 cm x 7 cm x 5.5 cm.
Comparable to : No. 17, Fig. 32, Nagarajunakonda (Subramanyam, 1975).

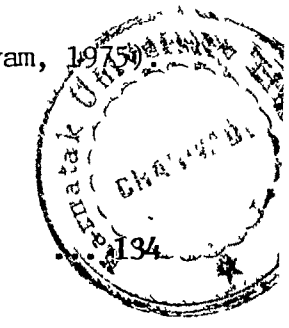
Figure II· Bifacial choppers

(5)

River valley : Bhadra Site: Dodgopenahalli
Rock material: Quartzite Tool type· Bifacial chopper

Description: Medium sized, oval in shape and has convex edge. Broad shallow flake scars on both the sides. Dorsal side has protruded cortex and the ventral side is flat. Semi-circular, butt end. Measures 10.5 cm x 9 cm x 4.5 cm.

Comparable to· No. 14, Fig. No. 31, Nagarjunakonda(Subramanyam, 1975).



(6)

River valley : Upper Tungabhadra Site: Chikbasur
Rock material: Quartzite Tool type: Bifacial chopper

Description: Triangular shaped; protruded dorsal side. Flat ventral side. Zigzag working edge attained by removing three bold flakes on the dorsal side and two thin flakes from the ventral side. Narrow butt end. Measures 8 cm x 8.5 cm x 3.3 cm.

Comparable to: No. 2, Fig. 13, Anagawadi (Pappu, 1974).

(7)

River valley: Upper Tungabhadra Site: Sidhlipura
Rock material: Quartzite Tool type: Bifacial chopper

Description: Made on a thick ovalish pebble. Convex working margin with a pointed tip. Shallow flake scars on the dorsal and ventral sides. Round bottom, semi-rolled. Measures 10 cm x 8.9 cm x 5.3 cm.

Comparable to: No. 1, Fig.21, Vadamadurai (Vidula Jayaswal, 1982).

(8)

River valley: Vedavati Site: Nidaghatta
Rock material: Quartzite Tool type: Bifacial chopper

Description: Medium sized, made on broken pebble; convex working edge, deep flake scars with patch of pebble cortex retained on both the sides. Uneven bottom due to deep flaking. Measures 11.5 x 8.5 x 7.5 cm

Comparable to· No. 25, Fig. 35, Nagarjunakonda (Subramanyam, 1975)

(9)

River valley : Hemavati Site: Bankal
Rock material: Quartzite Tool type: Bifacial chopper

Description: Made on a block; shallow step flake scars on both the sides. Zigzag convex edge achieved by alternate flaking. Thick at the centre, prominent ridge on one side. Thick uneven butt due to deep flaking. Semi-rolled. Measures 8.5 cm x 10 cm x 5 cm.

Comparable to: No. 13, Fig. 31, Nagarjunakonda (Subramanyam, 1975)

(10)

River valley· Vedavati Site· Nidaghatta
Rock material: Quartzite Tool type· Bifacial chopper

Description: Large sized; oval shaped; convex working edge achieved by removing deep flakes on both the sides. Thick at the centre. Patch of pebble cortex retained near the butt. Fresh.
Measures 14 cm x 10.5 cm x 8 cm.

Comparable to: No. 2, Fig. 37, Malaprabha (Joshi, 1955).

Figure III: Hand axes on core

(11)

River valley : Upper Tungabhadra Site: Nyamti
Rock material: Quartzite Tool type: Hand axe

Description: Medium sized, unfinished, made on oval shaped pebble. Shallow flaking on left half and upper portion on the dorsal side and half portion on the ventral side. Cortex retained in the remaining portions on both the sides. Tip retouched on the dorsal side. Fresh. Measures 13 cm x 8 cm x 5.2 cm.

Comparable to: No. 22, Fig. 5, Giddalur (III) Soundararajan, 1952).

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(12)

River valley : Upper Tungabhadra Site: Nyamti
Rock material: Quartzite Tool type: Hand axe

Description: Triangular shaped, having sharp pointed retouched tip, flaked upper and lower half; cortexed upto the butt. Protruded dorsal side and depressed ventral side. Fresh. Measures 12.5 cm x 7 cm x 7 cm.

Comparable to: KD 378 of Malaprabha (Joshi, 1955)

(13)

River valley : Upper Tungabhadra Site: Nyamti
Rock material: Quartzite Tool type· Hand axe

Description: Large sized and oval shaped. Both dorsal and ventral sides exhibit controlled step flaking. Prominent mid rib on the dorsal side. Round and thin tip. Symmetrical periphery. Thick at the centre and near the butt end. Fresh. Measures 20 cm x 11 cm x 8.36 cm.

Comparable to: No. 3, Plate VIII, Upper Krishna basin (Pappu, 1974).

(14)

River valley : Upper Tungabhadra Site: Nagasamudra
Rock material: Quartzite Tool type· Hand axe

Description: Roughly triangular shaped and heavy. Deep flaking of both the surfaces exhibits Abbivellian technique. Protruded dorsal side, zigzag working edge and the other margin is almost straight. Large flake removed near the butt seems to be a local feature. Rolled. Measures 17 cm x 12 cm x 8.8 cm.
Rare type.

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(15)

River valley : Upper Tungabhadra Site: Hadonahalli
Rock material: Quartzite Tool type: Hand axe

Description: Cordiform type. Shallow flaking on both the dorsal and ventral sides. Prominent mid rib on both the sides. Rounded tip. Deliberate notches below the tip probably for hafting the tool. Zigzag lateral sides. Rounded and broad thick butt. Rolled. Measures 13.5 cm x 10 cm x 7 cm.

Comparable to: (Roughly) No. 50, Fig. 8, Talapalle (Soundararajan,1952)

(16)

River valley : Upper Tungabhdra Site: Nagasamudra
Rock material: Quartzite Tool type: Hand axe

Description: Roughly triangular shaped; medium sized. Shallow flake scars on both the sides. Small patch of cortex retained on the dorsal side. Zigzag working edge due to alternate flaking. Notch near the tip obtained by shallow flaking. Flaked butt. Heavily rolled. Measures 9.5 cm x 8 cm x 5 cm.

Comparable to: No. 8 of Plate No.VIII, Lingadahalli (Seshadri, 1956).

(17)

River valley : Upper Tungabhdra Site· Nagasamudra
Rock material: Quartzite Tool type: Hand axe

Description: Oval shaped; made on brownish pebble. Uneven dorsal side. Alternate flaking to obtain zigzag working end on one side. Tip almost round and thin. Shallow flake scars near the butt. Rolled. Measures 15 cm x 9 cm x 5 cm.

Comparable to: No. 10 of Plate VIII, Lingadahalli (Seshadri, 1956)

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(18)

River valley : Upper Tungabhadra Site· Nagasamudra
Rock material: Quartzite Tool type: Hand axe

Description: Oval shaped; cordiform type, small in size. Shallow flaking on the ventral side. Flakes removed alternatively from lateral margin. Flaked and thick butt. Rounded tip. Heavily rolled. Measures 11 cm x 8 cm x 8 cm.

Comparable to: MNI 59 of Malaprabha (Joshi, 1955)

(19)

River valley : Kumudvati Site· Sudur
Rock material: Quartzite Tool type: Hand axe
Description: Oval shaped, made on brownish pebble. Shallow flaking on the dorsal side; prominent mid ridge. Patch of pebble cortex on the ventral side. Symmetrical edges. Thick at the centre. Heavily rolled. Measures 10.5 cm x 7.5 cm x 4.9 cm.

Comparable to: No. 29, Fig. 23, Nagarjunakonda (Subramanyam, 1975).

(20)

River valley : Bhadra Site· Dodgopenahalli
Rock material· Quartzite Tool type: Hand axe

Description: Pear-shaped; made on brownish pebble. Deep flake scars distinctly visible on both the sides. Prominent mid ridge. Working edge slightly zigzag. Tip attained by removing small flakes at the top. Deliberate notches on the lateral sides for hafting? Semi-rolled. Measures 14.5 cm x 8 cm x 5 cm.

Comparable to: No. 5, Fig.No. 16, Upper Krishna basin (Pappu, 1974).

(21)

River valley : Bhadra Site: Sompura
Rock material: Quartzite Tool type: Hand axe

Description: Triangular shaped, made on brownish pebble. Distinct shallow step flaking and patch of cortex on the dorsal side. Deep flaking on the ventral side. Truncated middle portion. Zigzag working edge. Thin and round point. Measures 11 cm x 9 cm x 4 cm.

Comparable to: No.4, Fig. 14, Upper Krishna basin (Pappu, 1975).

(22)

River valley : Tunga Site· Pilangere
Rock material: Quartzite Tool type: Hand axe

Description: Triangular shaped. Made on a brownish pebble. Shallow flaking on both the surfaces. Prominent protrusion near the butt on the dorsal side. Ventral side has prominent rib. Zigzag periphery due to alternate flaking. Beaked tip due to notch in the right side margin. Worked butt end. Rolled. Measures 10.5 cm x 7 cm x 5 cm.

Comparable to: No. 6, Fig. 2, Giddalur I (Soundararajan, 1952).

(23)

River valley : Hemavati Site: Bankal
Rock material: Quartz Tool type: Hand axe

Description: Sub-triangular shaped, made on a thick white pinkish core. Shallow flake scars on the dorsal side. A flake removed at 40° angle on the ventral side to achieve a thin working edge near the round tip. Deep flake scar near the butt on the ventral side; thick at the centre. Retouched straight periphery; bi-convex section. Uneven butt. Semi-rolled. Measures 10 cm x 10 cm x 5 cm.

Comparable to: No. 1, fig. 21, Nagarjunakonda (Subramanyam, 1975).

... 140

(24)

River valley : Hemavati Site· Bankal
Rock material: Quartz Tool type· Hand axe

Description: Cordiform hand axe made on a light pinkish pebble. Shallow flaking of the dorsal side. Prominent mid-ridge, deep flake removed near the top on the ventral side to achieve a thin round tip. Zigzag periphery; bi-convex cross section, uneven butt end. Semi rolled. Measures 12.5 cm x 10.5 cm x 6 cm.

Comparable to: No. 4, Fig. 21, Malaprabha basin (Joshi, 1955)
No. 29, Fig. 23, Nagarjunakonda (Subramanyam, 1975)

(25)

River valley : Upper Tungabhadra Site· Hadonahalli
Rock material: Quartzite Tool type: Hand axe

Description: Irregular triangular shaped; made on a thick end flake, zigzag left lateral margin. Thick right lateral margin due to removal of flake at 90° angle. Shallow flake scars on both the sides. Prominent mid rib on the dorsal side. Uneven butt end. Semi rolled. Measures 12 cm x 9 cm x 5 cm.

Comparable to: No. 21, Fig. 5, Giddalur (Soundararajan, 1952)

(26)

River valley : Upper Tungabhadra Site· Chikbasur
Rock material: Quartzite Tool type: Hand axe

Description: Made on a thick end flake almost transverse in shape. Shallow flake scars on the dorsal surface. Retouched left margin on the ventral surface near the tip. Semi rolled. Measures 10 cm x 8 cm x 4 cm.

Comparable to: No. 9, Plate IX, Talya (Seshadri, 1956).

(27)

River valley : Kumudvati Site· Sudur
Rock material: Quartzite Tool type Hand axe

Description: Roughly oval shaped having double point made on a thick brownish flake. Prominent mid ridge. Shallow step flake scars on the dorsal side. Point attained by removing a deep flake from the lateral sides at both the ends. Cortexed ventral side. Wavy working edge alround. Thick at the centre. Semi rolled. Measures 13 cm x 9.5 cm x 4.5 cm.

Comparable to: No. 1, Fig. 19, Malaprabha basin (Joshi, 1955)
No. 5, Fig. 14, Upper Krishna basin (Pappu, 1974)

(28)

River valley : Upper Tungabhadra Site: Nagasamudra
Rock material: Quartzite Tool type: Hand axe

Description· Sub-triangular shaped; made on a thick flake. Shallow flake scars visible on the dorsal side. Thin flake scars on the ventral side and pebble cortex. Prominent mid rib. Zigzag working end on one side. Pointed tip. Angular flake, slopes towards the butt end to obtain thick grip. Heavily rolled. Measures 12.5 cm x 10 cm x 5.5 cm.

Comparable to: No. 21, Fig. 5, Giddalur (Soundararajan, 1952)

(29)

River valley : Upper Tungabhadra Site: Nagasamudra
Rock material· Quartzite Tool type: Hand axe

Description· Made on a thick flake; triangular in shape. Shallow flake scars on the dorsal surface. Ventral surface is uneven and plain. Zigzag mid rib. Retouched working edges. Pointed tip. Striking platform retained near the butt. Positive bulb of percussion flaked. Fresh. Measures 16 cm x 10 cm x 5 cm.

Comparable to: No. 22, Fig. 5, Giddalur (Soundararajan, 1952)

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(30)

River valley : Vedavati Site: Nidaghatta
Rock material: Quartzite Tool type: Hand axe

Description: Cordiform type made on a brownish flake. Shallow elongated flake scars on the dorsal side. Prominent mid rib. A broad thin flake removed at steep angle on the ventral side to attain thin working edge. Thick and broad butt, uniform working edge. semi rolled. Measures 9 cm x 10 cm x 5 cm.

Comparable to: No. 4, Fig. 21, Malaprabha basin (Joshi, 1955)

(31)

River valley : Vedavati Site: Nidaghatta
Rock material: Dolerite Tool type: Hand axe
Description: Oval shaped, made on a greyish flake. Thin step flake scar on the dorsal side. Pebble cortex on the ventral side. Prominent mid ridge. A deep flake removed obliquely on the right lateral margin to achieve beaked point. Thick at the centre. Semi rolled. Measures 11 cm x 9 cm x 5 cm.

Comparable to: No. 2, Fig. 21, Nagarjunakonda (Subramanyam, 1975)

(32)

River valley : Vedavati Site: Nidaghatta
Rock material: Quartzite: Tool type: Hand axe

Description: Triangular shaped, made on a brownish thick flake. Shallow step flake scars on both the surfaces except a patch of cortex on the ventral side. Original steep surface on the left lateral margin retained deliberately to achieve pointed tip. Pointed at both the ends. Wavy periphery. Semi rolled. Measures 13 cm x 7.5 cm x 5 cm.

Comparable to: No.7, Pl. VII, Attirampakkam (Krishnaswamy, 1949).

(33)

River valley : Vedavati Site: Agrahara
Rock material: Quartzite Tool type: Hand axe

Description: Triangular shaped, made on a whitish flake. Shallow flake scars on both the surfaces. Ridge prominent on the dorsal side and thick at the centre. Beaked point attained by removing a deep flake near the far end. Retouched - wavy periphery alround. Slightly pointed butt. Semi rolled. Measures 9 cm x 6.5 cm x 2.5 cm.

Comparable to: No. 6, Fig. 2, Giddalur I (Soundararajan, 1952).

(34)

River valley : Vedavati Site: Agrahara
Rock material: Quartzite Tool type: Hand axe

Description: Triangular shaped, made on a pinkish flake. Broad shallow step flake scars on both the sides. Step partly due to cleavage of rock. Broken tip. Zigzag working edge alround. Flat striking platform. Semi rolled. Measures 10 cm x 8 cm x 2.5 cm.

Comparable to: No. 8, Pl. VIII, Lingadahalli (Seshadri, 1956).

(35)

River valley : Vedavati Site: Lakya
Rock material: Milky quartz Tool type: Hand axe

Description: Oval shaped, made on a flake. Both the surfaces fully worked with step flake scars. Step probably due to cleavage of the rock. Mid ridge almost straight and prominent. Thin wavy periphery. Deep flaking at the bottom. Broken tang. Fresh. Measures 10 m x 7 m x 4.5 m.

Comparable to: No. 23, Fig. No. 23, Nagarajunakonda (Subramanyam, 1975)

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(36)

River valley : Bhadra Site: Barandur
Rock material: Quartzite Tool type: Hand axe

Description: Pear shaped; made on a brownish flake. Step flaking on the ventral side. Dorsal side smooth due to rolling. Zigzag mid rib on the ventral side. Pointed at both the ends. Near the top, lateral sides have deliberate nothces probably for hafting. Slightly rolled. Measures15.2 cm x 8 cm x 3 cm.

Comparable to: No. 5, Fig. No. 16, Anagawadi, Upper Krishna Basin (Pappu, 1974)

(37)

River valley : Bhadra Site: Barandur
Rock material: Quartzite Tool type· Hand axe

Description: Made on a thin brownish flake. Patches of cortex on both the sides. Dorsal side has shallow step flaking scars. Ventral side has deep flake scars. Almost straight margins. A deep notch near the top on the ventral side restricts the width of the tip. Slightly rolled. Measures 11.5 cm x 6 cm x 3 cm.

Comparable to: No. 6, Pl. VI, Kibbanahalli (Seshadri, 1956)
No. 19, Fig.No. 22, Nagarjunakonda (Subramanyam, 1975).

(38)

River valley : Bhadra Site· Shankaraghatta
Rock material: Quartzite Tool type· Hand axe

Description: Oval shaped miniature hand axe made on brownish flake. Shallow step flake scars on both the sides. Flake scars inclined towards zigzag edge. Thick at the centre. Semi rolled. Measures 8.5 cm x 5.5 cm x 5 cm.

Comparable to: No. 13, Fig. 7 (Krishnaswamy, 1947).

(39)

River valley : Tunga Site: Honnapura
Rock material: Quartzite Tool type: Hand axe

Description: Oval shaped; made on a thick brownish flake. Both the dorsal and ventral surfaces exhibit numerous cleavage due to inferior rock material. Mid rib on dorsal side is distinctly visible. Steep flake scar on the ventral side near the tip. Thin lateral margins. Rolled. Measures 14 cm x 9.5 cm x 3 cm.

Rare type.

(40)

River valley : Tunga Site: Pilangere
Rock material: Quartzite Tool type: Hand axe
Description :Roughly triangular shaped; made on a thick brownish flake. Deep flake scars on the dorsal side. Ventral side has thin and shallow flake scars. Right lateral margin and the butt are rounded by removing thin flakes. Left lateral margin is distinctly zigzag. Borer like point obtained by removing a vertical flake near the upper part of right lateral side. Rolled. Measures 10 cm x 8 cm x 4.5 cm.

Rare type.

(41)

River valley: Tunga Site: Pilangere
Rock material: Quartzite Tool type: Hand axe
Description: Roughly triangular, made on a brownish flake. Steep flaking on dorsal side,converging at the centre. Ventral side plain and shallow at the centre. Symmetrical lateral margins. Butt obtained by removing a flake at 60° angle. Measures 14 cm x 9.5 cm x 3 cm.

Comparable to: No. 12, Pl. VIII, Attirampakkam (Seshadri, 1956)

(42)

River valley : Tunga Site: Harıharapura
Rock material: Quartzıte Tool type: Hand axe

Descrıption: Roughly oval shaped. Made on a thıck brownısh flake. Shallow flaking of both the dorsal and ventral surfaces. Retouched zıgzag margıns. Thıck at the bottom. Rounded butt. Rolled. Measures 15.6 cm x 8.5 cm x 4.6 cm.

Comparable to: CMG 797, Malaaprabha (Joshı, 1955).

(43)

River valley : Hemavatı Site: Bankal
Rock materıal: Quartzıte Tool type: Hand axe

Descrıption: Roughly oval shaped, made on a thick flake. Broad thın flakes removed at 40° angle on the dorsal sıde resultıng ın prominent mid rıdge. Two thın flakes at 30° angle removed on the ventral sıde to achıeve thın zigzag workıng edge. Poınted at both the ends. Bı-convex cross sectıon. Semı rolled. Measures 15 cm x 8 cm x 3 cm.

Comparable to: No. 2, Fıg. 19, Malaprabha basın (Joshı, 1955).

(44)

Rıver valley : Hemavatı Sıte: Kattebelgulı
Rock material: Quartzıte Tool type: Hand axe

Descriptıon: Ovate made on a brownısh flake. The dorsal surface well flaked and a small patch of cortex near the butt. Plaın ventral sıde. Thıck at the centre. Bı-convex cross sectıon. Fresh. Measures 16.5 cm x 13.2 cm x 5 cm.

Comparable to: No. 44, Fıg. 33, Nagarjunakonda (Subramanyam, 1975).

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(45)

River valley : Upper Kaveri — Site: Rudrapatna

Rock material: Quartzite — Tool type: Hand axe

Description: Triangular shaped, made on brownish flake. Thin broad flake scars on the dorsal side; prominent mid ridge. Ventral side unworked. Thin symmetrical margin. A deep notch on the right lateral side to obtain curved or beak shaped pointed tip. Semi rolled. Measures 14.5 cm x 10.5 cm x 4.5 cm.

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(46)

River valley : Upper Kaveri Site: Rudrapatna
Rock material: Quartzite Tool type: Hand axe

Description: Pear shaped, made on brownish flake. Shallow flake scars and prominent mid ridge on both the sides. Thick at the centre. Rounded tip. Wavy periphery. Semi rolled. Measures 13 cm x 7.5 cm x 5 cm.

Comparable to: No. 50, Fig. 8, Tallapalle (Soundararajan, 1952).

(47)

River valley : Upper Kaveri Site: Konanur
Rock material: Quartzite Tool type: Hand axe

Description: Oval shaped; made on a thick pinkish flake. Bifacially flaked. Two shallow flake scars and prominent mid ridge on the dorsal side. Thin pointed tip attained by removing a flake at 45° angle on the ventral side. Cleavage of rock seems to be responsible for step flake scars. Wavy thin working edge. Measures 11.5 cm x 8.5 cm x 5 cm.

Comparable to: No. 37, Fig. No. 24, Nagarjunakonda (Subramanyam, 1975).

(48)

River valley : Vedavati Site: Gedlahalli
Rock material: Quartzite Tool type: Hand axe

Description: Triangular shaped, made on a thin brownish flake. Shallow flaking of the dorsal surface. Plain ventral surface and natural cutting from middle above retained to obtain pointed working tip. Retouched side margin on the ventral side as well as of bottom on the dorsal side. Thick near the left lateral margin. Fresh. Measures 11.6 cm x 9.10 cm x 3.01 cm.

Comparable: Roughly to No. 9, Fig. 21, Nagarjunakonda (Subramanyam, 1975)

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(49)

River valley : Vedavati Site: Gedlahalli
Rock material: Quartzite Tool type: Hand axe

Description: Triangular shaped, made on a thick brownish flake. Shallow flaking of the dorsal side at steep angle forming prominent mid rib. Shallow flake scars on the ventral side and platform near the bottom. Retouched margins on both the surfaces. Pointed tip. Fresh. Measures 9.7 cm x 8 cm x 4 cm.

(50)

River valley : Vedavati Site: Gedlahalli
Rock material: Quartz Tool type: Hand axe

Description: Cordiform type made on a thick bluish flake. Shallow stepped flake scars on both the ventral and dorsal surfaces. Thick at the centre. Minute secondary retouched margins. Thin round tip. Flat platform at the bottom along the left margin. Fresh. Measures 8.7 cm x 7.1 cm x 4 cm.

Comparable to: No. 9, Fig. 3, Giddalur I (Soundararajan, 1952).

Figure V: Discoids

(51)

River valley : Upper Tungabhadra Site: Vaderpura
Rock material: Quartzite Tool type: Discoid

Description: Made on core. Shallow flake scars converging at the middle of dorsal side and patch of pebble cortex. Shallow flaking on ventral side. Zigzag working edge. Thick at the centre. Rolled Measures 10.5 cm x 9 cm x 6 cm.

Comparable to: No. 8, Pl. 8, Lingadahalli (Seshadri, 1956)

... 150

(52)

River valley : Tunga Site: Honnapur
Rock material: Quartzite Tool type: Discoid

Description: Made on a brownish pebble. Bifacially flaked, shallow flake scars. Zigzag periphery due to alternate flaking. Rolled. Measures 9.5 cm x 7.5 cm x 4 cm.

Comparable to: Specimens from Kibbanahalli (Seshadri, 1956)

(53)

River valley : Vedavati Site: Agrahara
Rock material: Milky quartz Tool type· Discoid

Description: Made on a thick flake; step flake scars on both the sides. Prominent ridge on the dorsal side. Flat striking platforms at both the ends. Thin wavy periphery alround. Thick at the centre. Semi rolled. Measures 8 cm x 7.5 cm x 4 cm.

Comparable to: No. 9, Fig. 20, Upper Krishna (Pappu, 1974).

(54)

River valley : Upper Kaveri Site: Konanur
Rock material: Quartzite Tool type: Discoid

Description: Made on core, pinkish in colour. Bifacial flaking. Step flake scars probably due to cleavage of rock. Thick at the centre. Wavy edge alround. Fresh. Measures 8 cm x 7.5 cm x 6 cm.

Comparable to: Pl. No. 9, Lingadahalli (Seshadri, 1956).

151

(55)

River valley : Vedavatı Sıte: Gedlahallı
Rock materıal: Quartzıte Tool type: Dıscoıd

Description: Round in shape, made on a thıck whıtısh brown flake. Prepared core technıque clearly vısıble on the dorsal surface. Shallow flakıng oń the ventral surface. Thıck at the centre. Wavy workıng edge. Fresh. Measures 7.8 cm x 7.8 cm x 3.5 cm.

Comparable to: No. 1, Pl. No. XI, Nıdaghatta (Seshadrı, 1956).

(56)

River valley : Vedavatı Sıte: Gedlahallı
Rock material: Quartzıte Tool type· Dıscoıd

Descriptıon: Round ın shape made on a thıck whıtısh brown prepáred core. Shallow flakıng of the ventral surface. A small patch of cortex retaıned on the dorsal sıde. Zıgzag margın. Fresh. Measures 8.6 cm x 7.5 cm x 4.8 cm.

Comparable to: No. 4, Pl. No. X, Nıdaghatta (Seshadrı, 1956)

Fıgure VI: Cleaver and Scraper

(57)

Rıver valley : Tunga Sıte: Honnapura
Rock materıal: Quartzıte Tool type: Cleaver

Descriptıon: Medium sızed 'U' shaped; made on a brownısh flake. Lateral margıns almost straıght. Depressıon near the butt on the dorsal side. Posıtıve bulb on the ventral sıde. Retouched, thın curved workıng end. Thıck butt. Rolled. Measures 12.5 cm x 8 cm x 2.5 cm.

Comparable to: No. 5, Fıg. 19, Upper Krıshna basın (Pappu, 1974)

... 152

(58)

River valley : Vedavati Site: Agrahara

Rock material: Quartzite Tool type: Cleaver

Description: Small in size; 'U' shaped on the thin brownish flake. Lateral margins almost straight and converge towards butt. Wavy cutting edge. Shallow flakes inclining towards the margins. Thick at the centre. Fresh. Measures 8.8 cm x 5.2 cm x 3.2 cm.

Rare type.

(59)

River valley : Upper Tungabhadra Site· Nagasamudra

Rock material: Quartzite Tool type: Side scraper

Description: Made on a thick brownish flake. Dorsal side fully flaked. Two shallow flake scars and cortexed ventral side. Convex right lateral margin. Straight left margin. Rolled. Measures 11 cm x 8 cm x 4 cm.

Comparable to: No. 1, Pl. III, Upper Krishna basin (Pappu, 1974).

(60)

River valley : Bhadra Site: Sidhlipura

Rock material: Quartzite Tool type: Side scrapar

Description: Made on a Levalloisian flake of brownish colour. Shallow flakes converging at the middle on dorsal side. Deep flake scar and prominent bulb of percussion on the ventral side. Single working edge. Semi rolled. Measures 8 cm x 4 cm x 2.5 cm.

Rare type.

... 153

(61)

River valley : Upper Kaveri Site: Rudrapatna
Rock material: Quartzite Tool type: Side scraper

Description: Made on flake of brown colour. Shallow step flake scars on the dorsal side. Wavy mid ridge. Convex working edge. Thick at the centre. Thin broad flake scars on the ventral side. Semi rolled. Measures 12 cm x 9 cm x 3 cm.

Comparable to: No. 29, Fig. 35, Nagarjunakonda (Subramanyam, 1975).

(62)

River valley : Vedavati Site: Gedlahalli
Rock material: Quartzite Tool type: Side scraper

Description: Scraper made on a thick brownish flake roughly rectangular in shape. Shallow flake scar running steeply from left to right margin on the dorsal side. Prominent positive bulb of percussion on the ventral side. Straight left margin. Right margin and bottom edge retouched from both the sides. Fresh. Measures 9 cm x 6.1 cm x 2.5 cm.

Rare type.

(63)

River valley: Tunga Site: Honnapura
Rock material: Quartzite Tool type: Scraper

Description: Traingular beak type scraper made on thick brown flake. Shallow flaking on the dorsal side. Uneven ventral surface. The thin left lateral margin is curved at 70° angle. Uneven and thick right lateral margin. Retouched working edge. Flat curved tip. Broad at the base. Rolled. Measures 12.5 cm x 7 cm x 1.5 cm.

Rare type.

... 154

(64)

River valley : Bhadra Site: Sidhlipura
Rock material: Quartzite Tool type· Double sided scraper

Description: Made on medium sized brown flake. Prominent mid ridge. Heavily rolled. Pointed tip. Measures 8.5 cm x 6.5 cm x 3 cm.

Rare type.

Figure VII : Scrapers

(65)

River valley : Vedavati Site· Nidaghatta
Rock material: Quartzite Tool type. Round scraper

Description: Made on Levalloisian flake of pinkish colour. Deep flake scar at the centre on the dorsal side. Step flaking on the ventral side. Shallow flaking on the periphery to obtain wavy working edge alround. Semi rolled. Measures 8 cm x 6 cm x 2.5 cm

Comparable to: No. 1, Fig. 2, Nittur (Ansari, 1980).

(66)

River valley : Vedavati Site: Gedlahalli
Rock material: Quartzite Tool type: Rectangular scraper

Description: It is made on a thin brownish flake, shallow flaking on both the surfaces. Thin retouched margin alround. Fresh. Measures 6 cm x 6 cm x 2 cm.

Rare type.

(67)

River valley : Vedavatı Sıte· Gedlahallı
Rock materıal: Quartzıte Tool type· End scraper

Descrıptıon: It ıs made on a thıck brownısh flake. Shallow flake scars on the dorsal sıde from bottom towards the workıng end. Depressed ventral surface. Thıck at the centre and bottom. Workıng edge at the far end, retouched from both the surfaces. Fresh. Measures 6.3 cm x 6.3 cm x 4.2 cm.

Rare type.

(68)

Rıver valley : Vedavatı Sıte. Nıdaghatta
Rock materıal: Quartzıte Tool type· Rectangular scraper

Descrıptıon: Made on thıck brownısh flake. Shallow step flakıng on the dorsal sıde. Shallow flakıng on the ventral sıde. Workıng edge retouched on one of the lateral sıdes. Semı rolled. Measures 14 cm x 7 cm x 4 cm.

Comparable to: No. 5, Fıg. 37, Malaprabha basın (Joshı, 1956).

(69)

River valley : Upper Kaverı Sıte: Rudrapatna
Rock materıal: Jasper Tool type: End scraper

Descrıptıon: Made on a core. Shallow flakıng of the dorsal surface. Pebble cortex retaıned on the ventral sıde. Workıng edge characterısed by numerous steps. Semı rolled. Measures 7.5 cm x 6.5 cm x 2.5 cm.

Rare type.

... 156

(70)

River valley : Upper Kaveri Site:Rudrapatna
Rock material: Jasper Tool type: End scraper

Description: Made on thick core of blackish-brown colour. Shallow elongated flake scars on the dorsal side. Uneven ventral side. Retouched working edge. Semi rolled. Measures 8.5 cm x 7 cm x 5 cm.

Rare type.

Figure VIII : Point group

(71)

River valley : Bhadra Site: Barandur
Rock material: Quartzite Tool type: Scraper cum point

Description: Made on an oval shaped flake of brown colour. Shallow flaking on the dorsal side. Cortexed ventral surface. Prominent ridge. Pointed tip. Heavily rolled. Measures 9.5 cm x 6.5 cm x 2.5 cm.

Rare type.

(72)

River valley : Vedavati Site: Nidaghatta
Rock material: Quartzite Tool type: Pointed flake (or borer)

Description: Triangular leaf shaped; made on brownish flake. Shallow flake scars and prominent mid ridge on the dorsal side. Unworked ventral surface. Pointed tip. Edge retouched. Semi rolled. Measures 11.5 cm x 5.5 cm x 2.5 cm.

Comparable to: Specimens from Attirampakkam (Ancient India, 1948) as well as from Upper Siwalik hills (Sharma, 1979).

... 157

(73)

River valley : Vedavati Site: Nidaghatta
Rock material: Quartzite Tool type: Borer

Description: Made on thin brownish flake. Step flaking on the dorsal side. Prominent bulb of percussion on the ventral side. Elongated borer tip achieved by removing deep flakes from the lateral margins. Prepared platform. Broken tip. Broad zigzag base. Fresh. Measures 7.5 cm x 7 cm x 2.5 cm.

Comparable to: Nos. 1 & 2, Pl. VII, Kibbanahalli (Seshadri, 1956).

(74)

River valley : Vedavati Site. Gedlahalli
Rock material: Quartzite Tool type: Borer
Description: It is made on a thick brownish flake. Most of the original surface of the rock retained including a portion of the right lateral margin from middle above. Deep notch near the far end on the left lateral margin to obtain working point. Bottom retouched from both the sides. Fresh. Measures 8.5 cm x 6.8 cm x 2.5 cm.

Comparable to: No. 2, Pl. VII, Nidaghatta (Seshadri, 1956).

(75)

River valley : Bhadra Site: Barandur
Rock material: Quartzite Tool type: Borer

Description: Triangular shaped, made on brownish Levalloisian flake. Shallow broad flaking of the dorsal side. Depressed ventral side. Pointed tip attained by removing two large flakes on either side of the dorsal surface. Prominent ridge; thick at the centre. Semi rolled. Measures 11.5 cm x 7.5 cm x 4 cm.

Comparable to: No. 2, Pl. VII, Kibbanahalli (Seshadri, 1956).

... 158

(76)

River valley : Vedavati Site: Nidaghatta
Rock material: Quartz Tool type: Point

Description: Triangular shaped; made on thick whitish flake. Shallow flaking on both the surfaces. Deep flake removed near the top on the right lateral side to obtain point. Semi rolled. Measures 9 cm x 5 cm x 2 cm.

Rare type.

(77)

River valley : Vedavati Site: Lakya
Rock material: Milky quartz Tool type: Point
Description: Triangular shaped, made on thick whitish flake. Dorsal side fully flaked; mid ridge. Shallow flaking on the ventral side. Flat striking platform. Broken tip. Fresh. Measures 7.5 cm x 4 cm x 2 cm.

Rare type.

(78)

River valley : Vedavati Site: Gedlahalli
Rock material: Quartzite Tool type: Point

Description: It is made on a thick brownish flake. Shallow flake scars on the dorsal side. Plain ventral surface. Straight right margin. Convex left margin and a deep notch at the far end to obtain a beak like tip. Fresh. Measures 7.3 cm x 4.8 cm x 2.5 cm.

Rare type.

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(79)

River valley : Vedavatı Sıte: Gedlahallı
Rock materıal: Quartzıte Tool type· Blade

Descriptıon: It ıs made on a long thıck brownısh rectangular flake. Shallow flake scars on both the surfaces slopıng from the mıddle towards the margın. Zigzag mıd rıb. Concave rıght lateral margın. Slıght retouch on left lateral margın as well as far end. Fresh. Measures 9.4 cm x 4.5 cm x 2.8 cm.

Rare type.

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LOWER PALAEOLITHIC TOOL TYPES

Illustrations

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a) Longitudinal profile and section details of the river Tunga and the Upper Tungabhadra

b) Longitudinal profile and section details of the river Bhadra

c) Longitudinal profile and section details of the river Hemavati

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Fig. II : Bifacial choppers

Fig. III : Hand axes on core

Fig. IV : Hand axes on flake

Fig. V : Discoids

Fig.VI : Cleavers

Fig. VII : Scraper group

Fig. VIII : Point group

Scale of illustrations (Drawing):

Sl. Nos. 60, 62, 65 to 67, 69, 70, 74, 76, 77 & 78 :
are drawn to 1:¼
Sl. Nos. 51 to 56, 58, 59, 61, 63, 64, 68, 72, 73, 75 & 79 :
are drawn to 1:½
Sl. No. 1 to 50 & 57 are drawn to 1:$^{2}/_{3}$

Note: Serial numbers of tools mentioned in the description are common to the drawings as well as plates.

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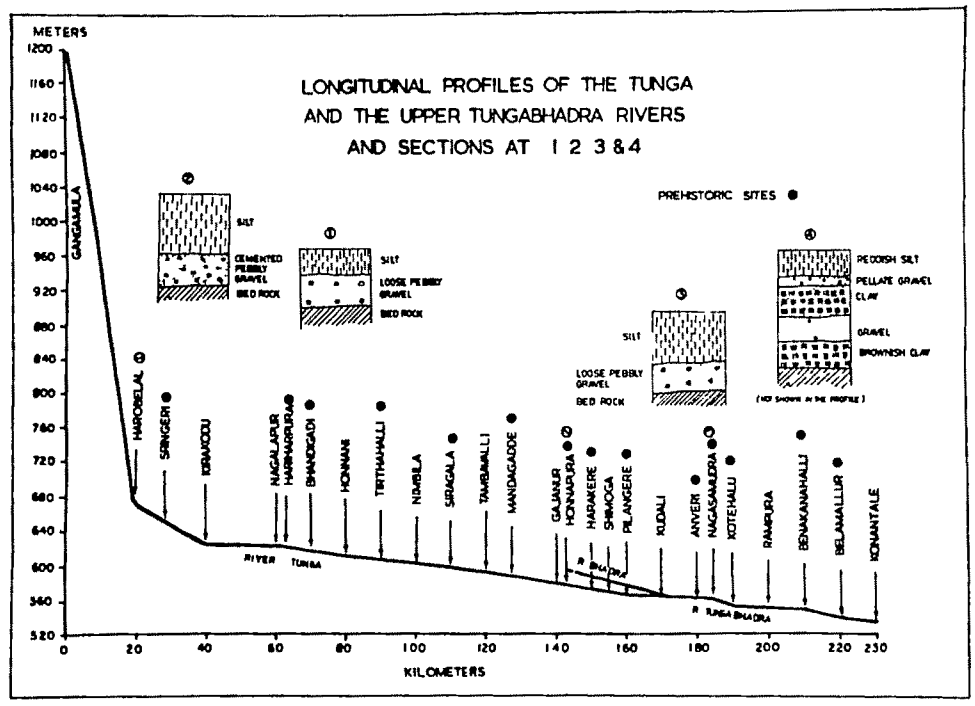
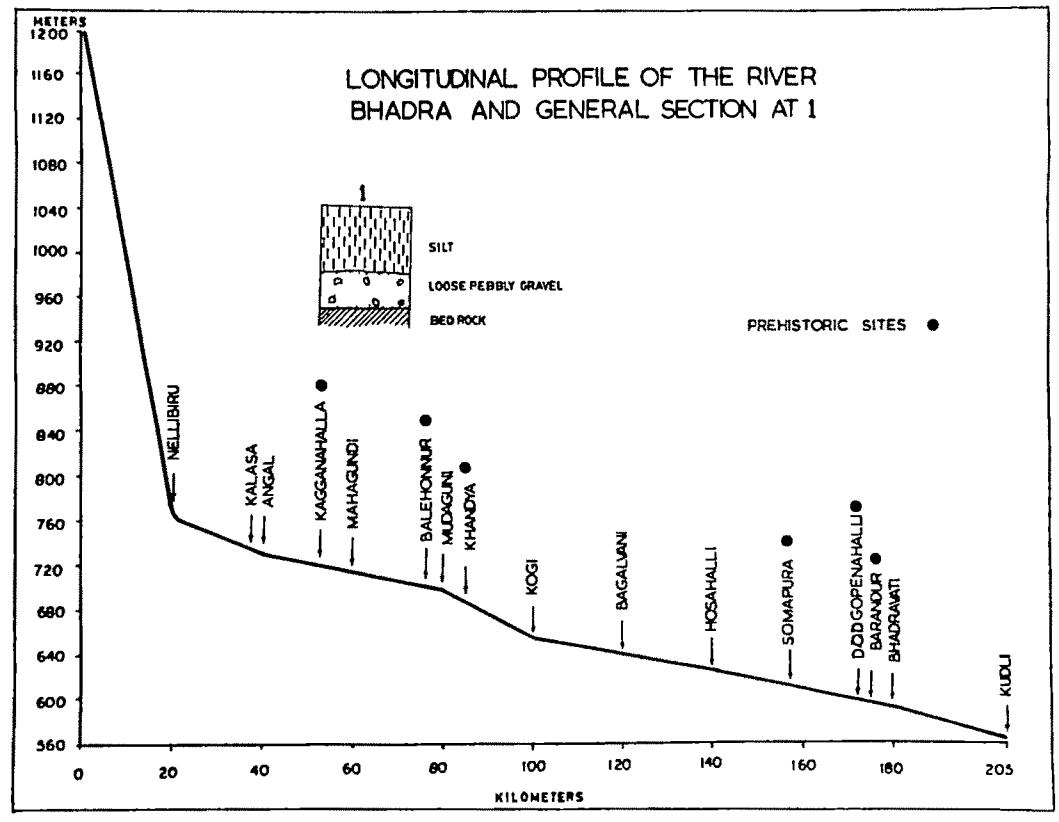

LONGITUDINAL PROFILES OF THE TUNGA
AND THE UPPER TUNGABHADRA RIVERS
AND SECTIONS AT 1 2 3 & 4
METERS
KILOMETERS
PREHISTORIC SITES
GANGAMULA
HAROBELAL
SRINGERI
KONAKODU
NAGALAPUR
HARIHARPURA
BHANDIGADI
HONNALI
TIRTHAHALLI
NUMBLA
SIRAGALA
TAMBIHALLI
MANDAGADDE
GAJANUR
HONNAPURA
HARAKERE
SHIMOGA
PILANGERE
KUDALI
ANVERI
NAGASAMUDRA
KOTEHALLI
RANIPURA
BENAKANAHALLI
BELAMALLUR
KONANTALE
RIVER TUNGA
R. BHADRA
R. TUNGA BHADRA
SILT
CEMENTED PEBBLY GRAVEL
BED ROCK
SILT
LOOSE PEBBLY GRAVEL
BED ROCK
SILT
LOOSE PEBBLY GRAVEL
BED ROCK
PEDDISH SILT
PELLATE GRAVEL
CLAY
GRAVEL
BROWNISH CLAY
(NOT SHOWN IN THE PROFILE)


LONGITUDINAL PROFILE OF THE RIVER
BHADRA AND GENERAL SECTION AT 1
SILT
LOOSE PEBBLY GRAVEL
BED ROCK
PREHISTORIC SITES
METERS
1200
1160
1120
1080
1040
1000
960
920
880
840
800
760
720
680
640
600
560
NELLUBIRU
KALASA
AINGAL
KAGGANAHALLA
MAHAGUNDI
BALEHONNUR
MUDAGUNI
KHANDYA
KOGI
BAGALWANI
HOSAHALLI
SOMAPURA
DODGOPENAHALLI
BARANDUR
BHADRAVATI
KUDLI
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20
40
60
80
100
120
140
160
180
205
KILOMETERS

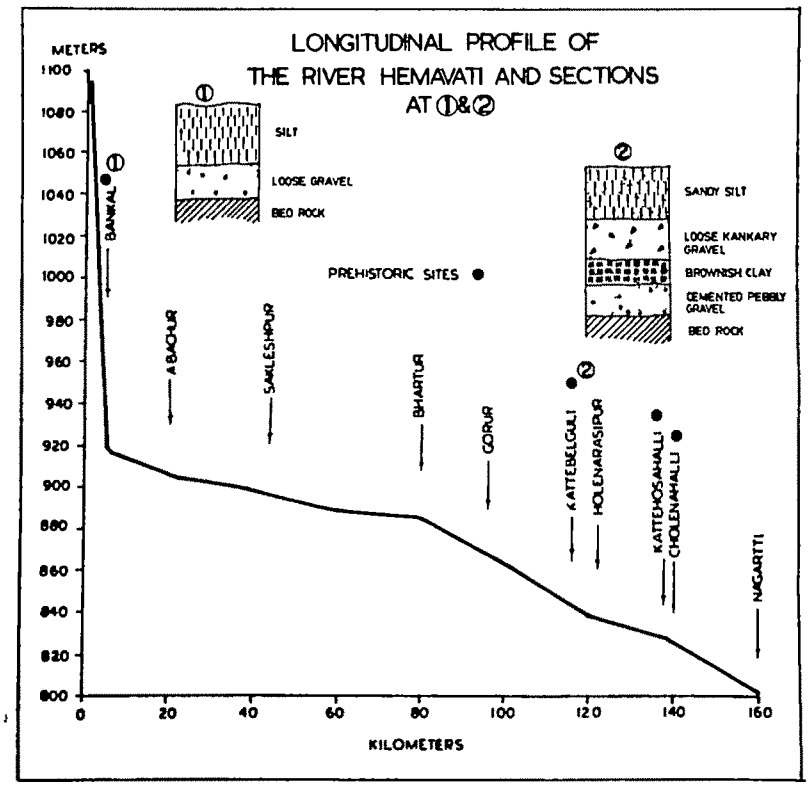
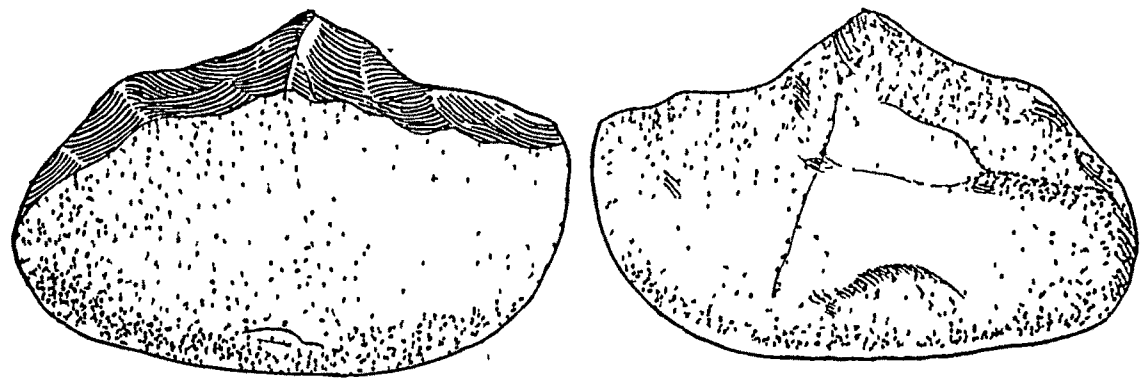

LONGITUDINAL PROFILE OF
THE RIVER HEMAVATI AND SECTIONS
AT ①&②
METERS
1100
1080
1060
1040
1020
1000
980
960
940
920
900
880
860
840
820
800
0
20
40
60
80
100
120
140
160
KILOMETERS
BANKAL ①
ABACHUR
SAKLESHPUR
BHARTUR
GORUR
KATTEBELGULI ②
HOLENARASIPUR ②
KATTEHOSAHALLI
CHOLENAHALLI
NAGARTTI
PREHISTORIC SITES
① SILT
LOOSE GRAVEL
BED ROCK
② SANDY SILT
LOOSE KANKARY GRAVEL
BROWNISH CLAY
CEMENTED PEBBLY GRAVEL
BED ROCK

Fig. 1 ; UNIFACIAL CHOPPERS



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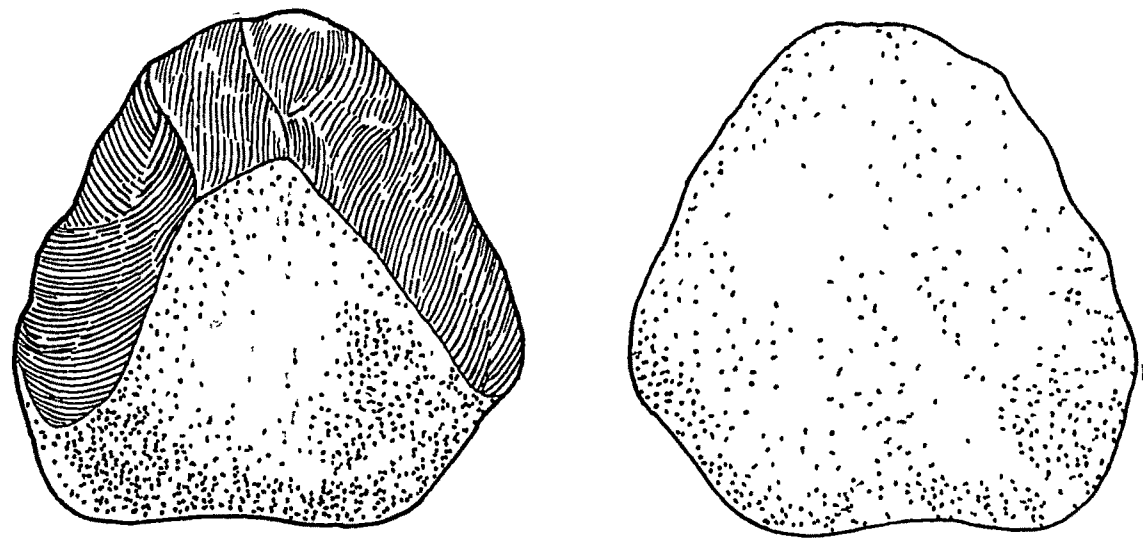

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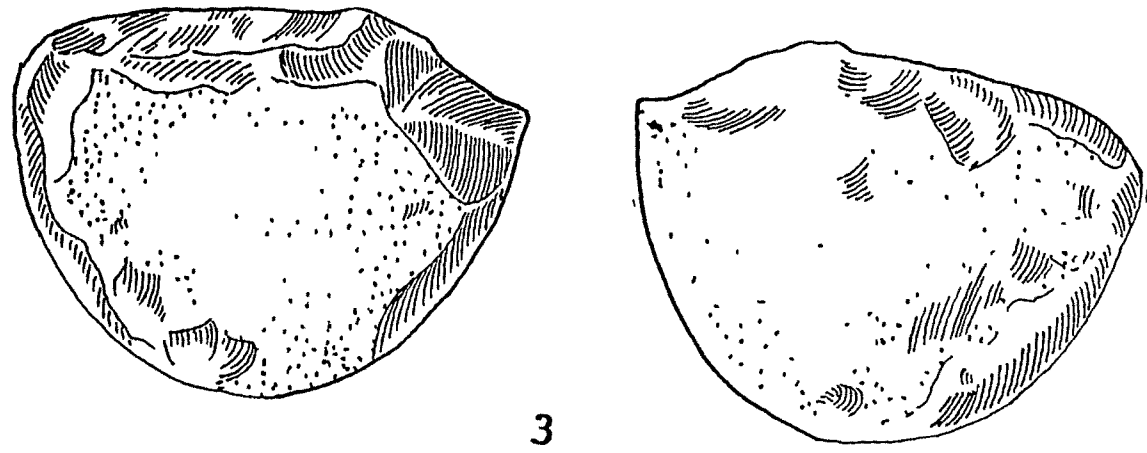

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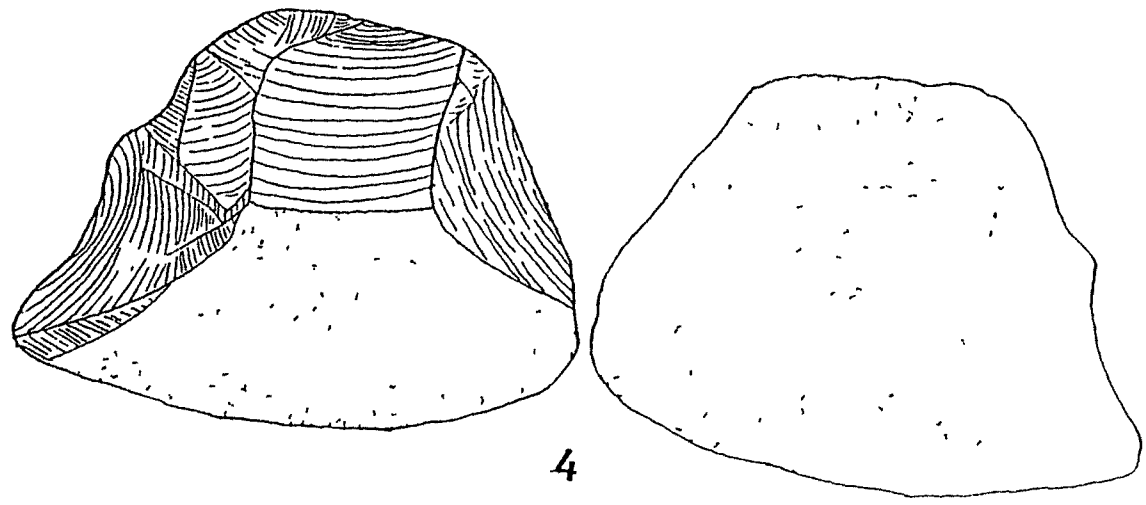

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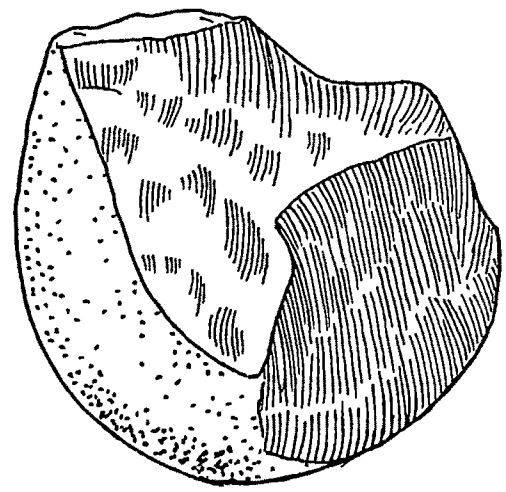
FIG. II : BIFACIAL CHOPPERS



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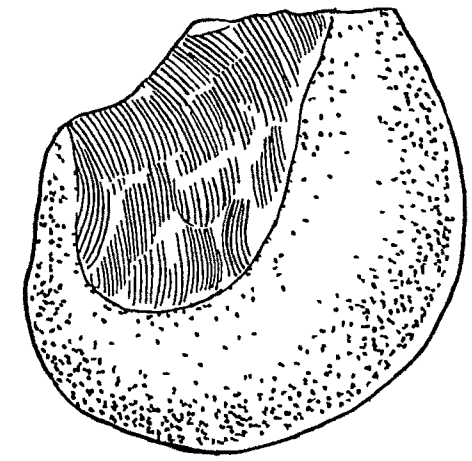

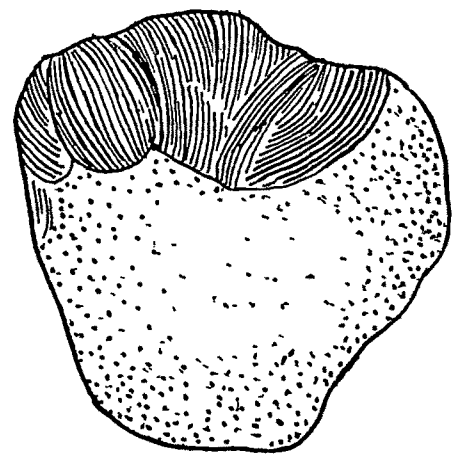

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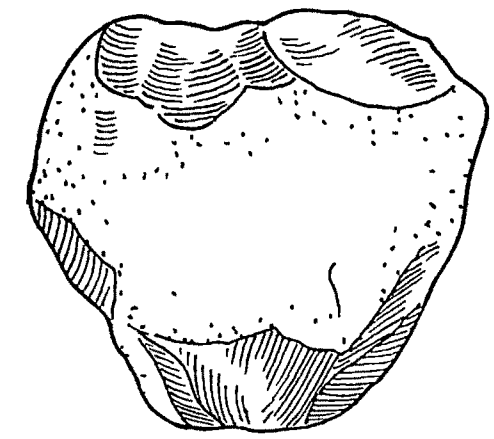

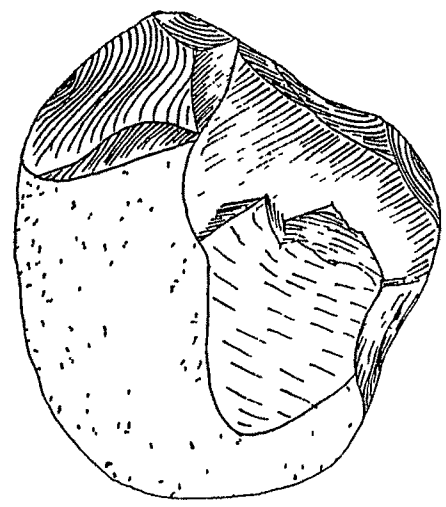

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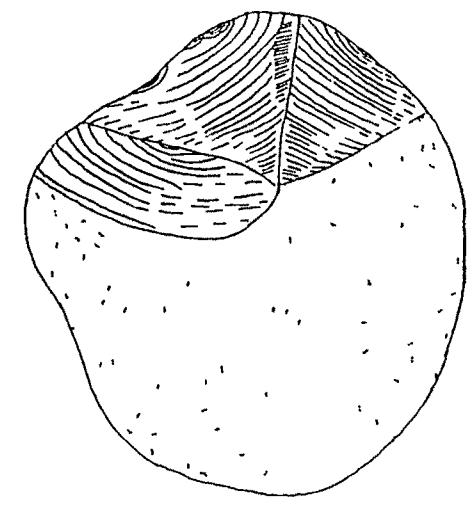

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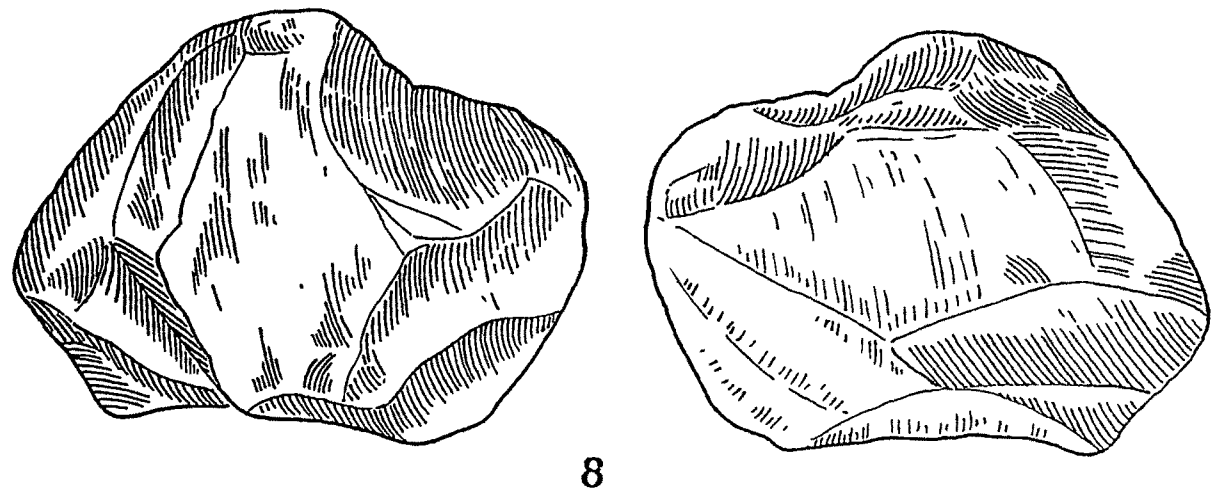

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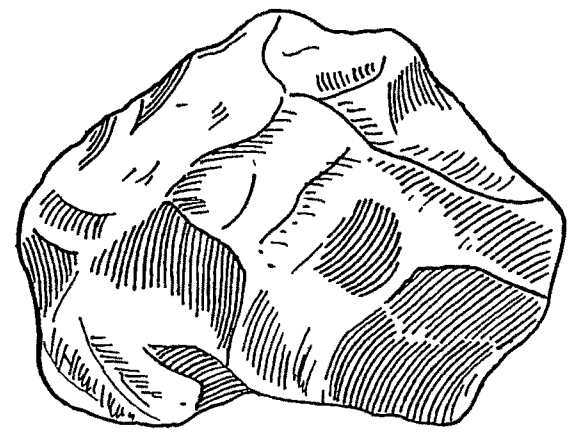

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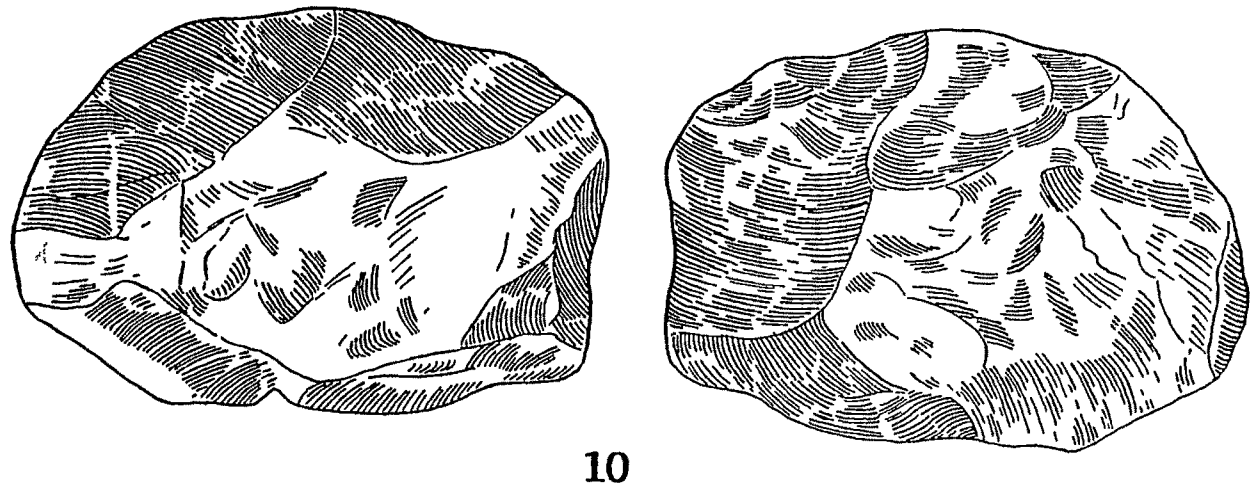

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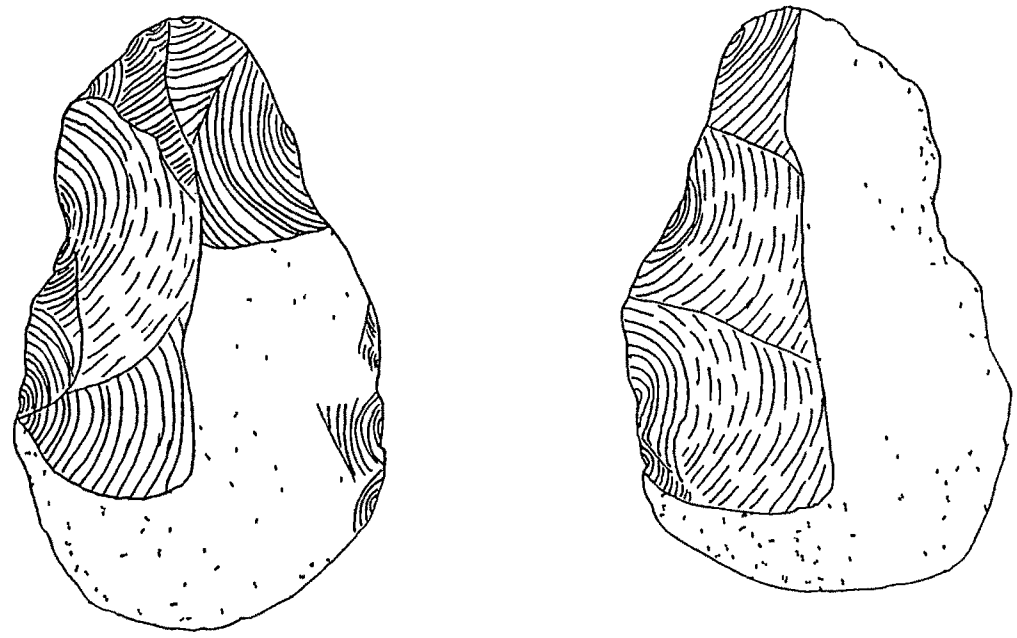
FIG III : HAND AXES ON CORE



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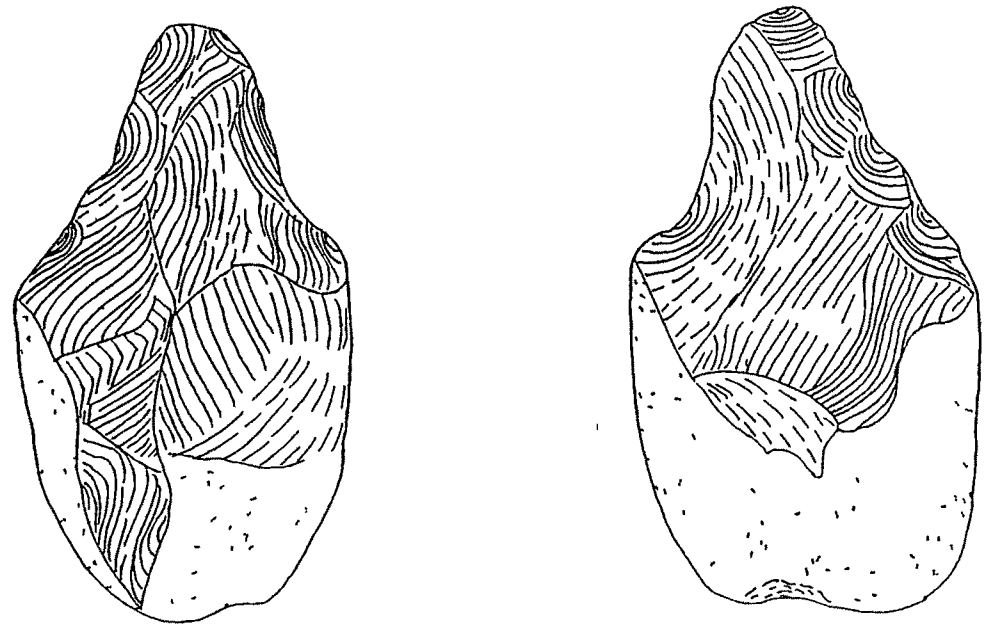

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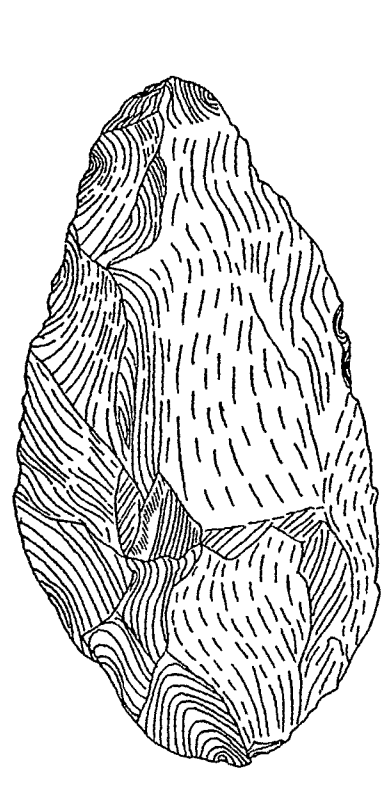

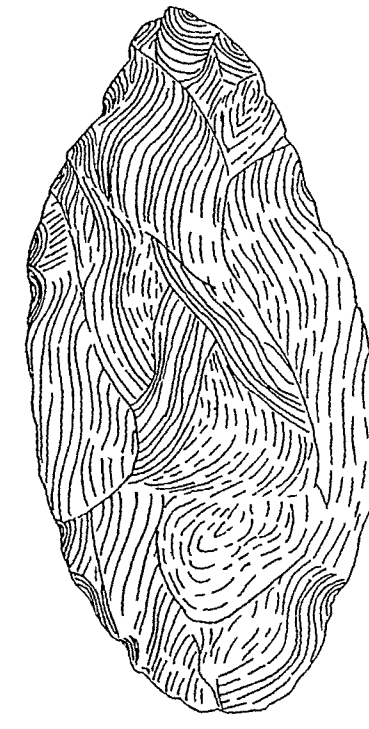

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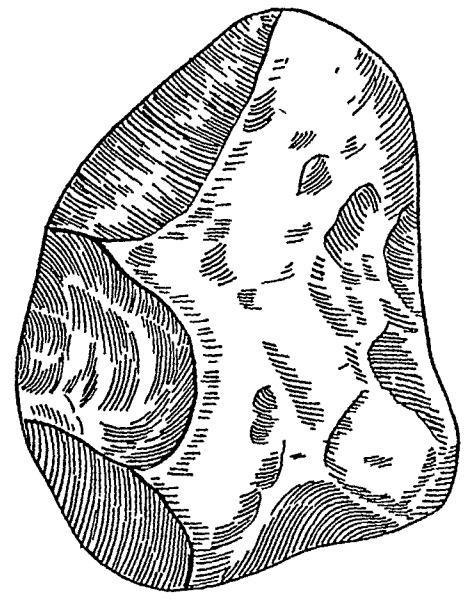

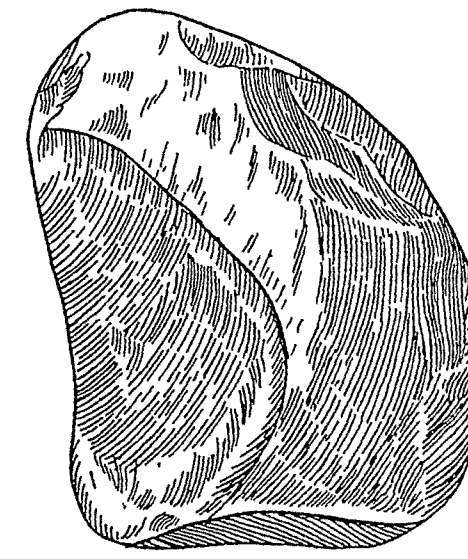

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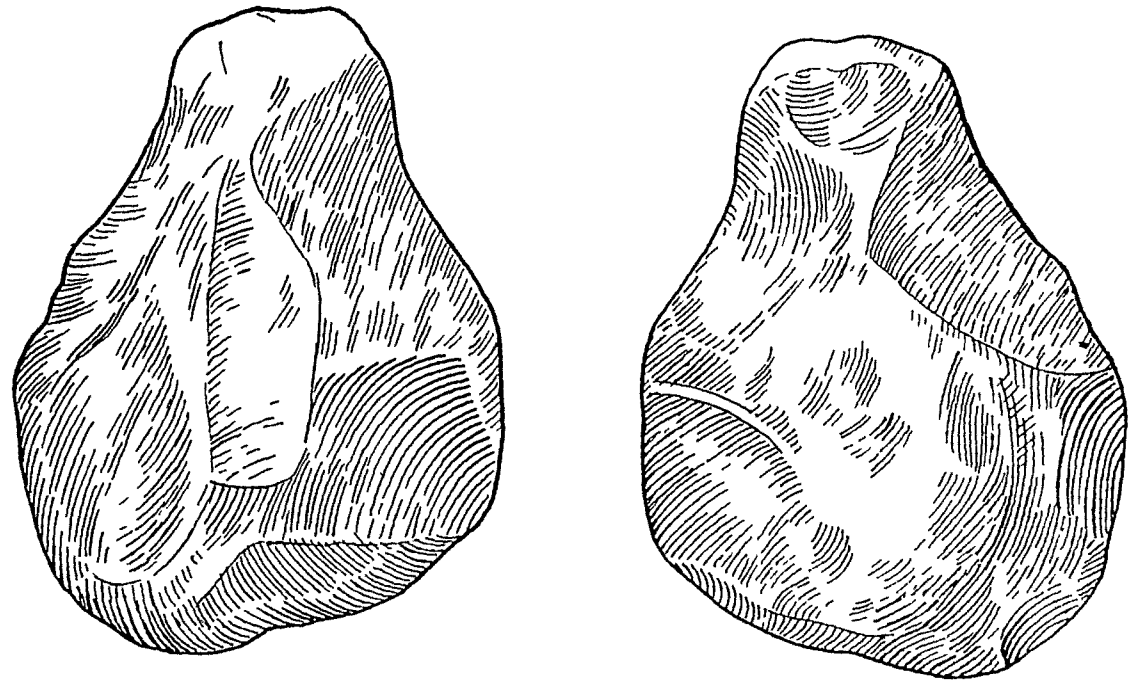

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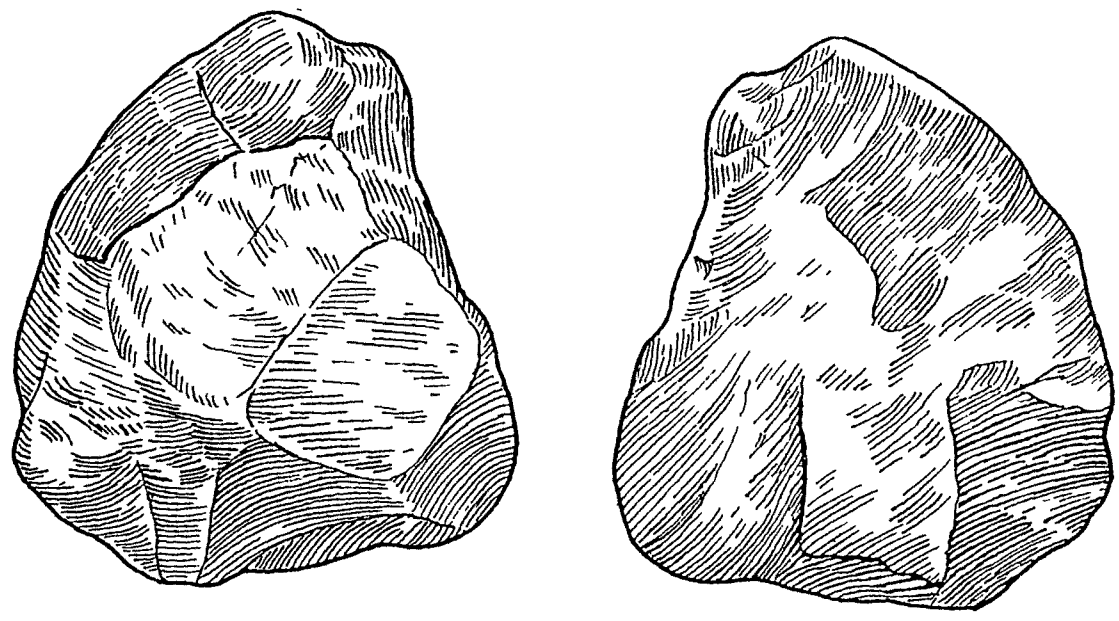

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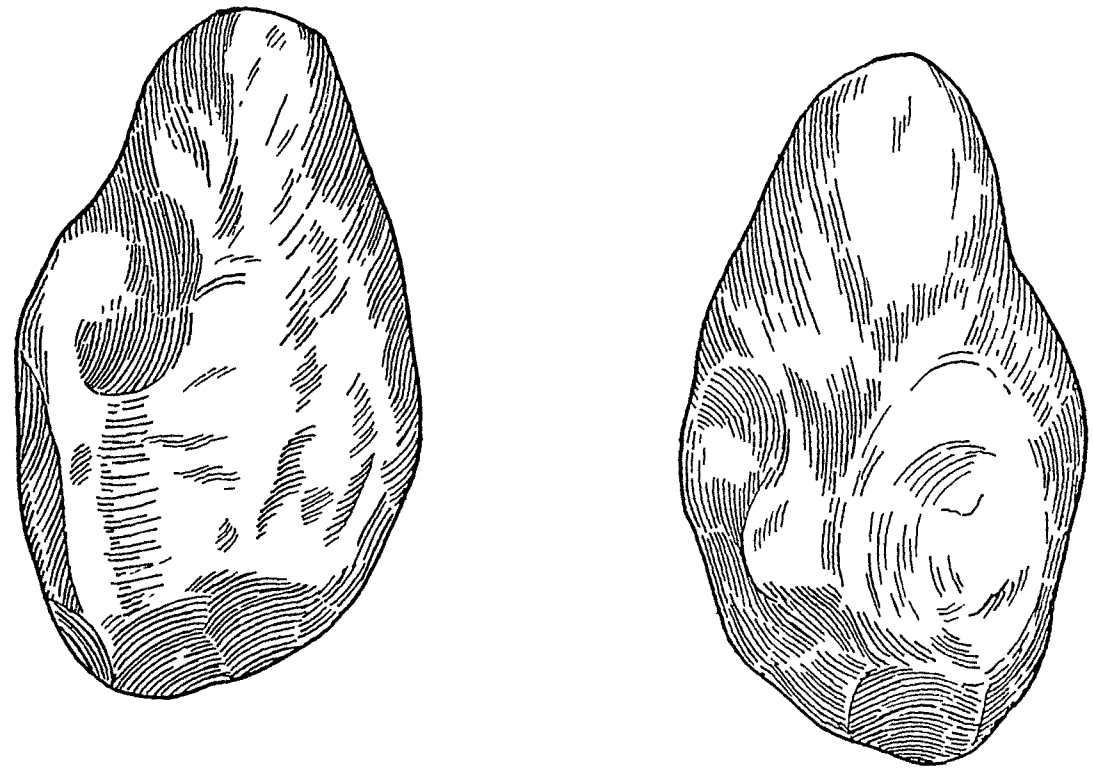

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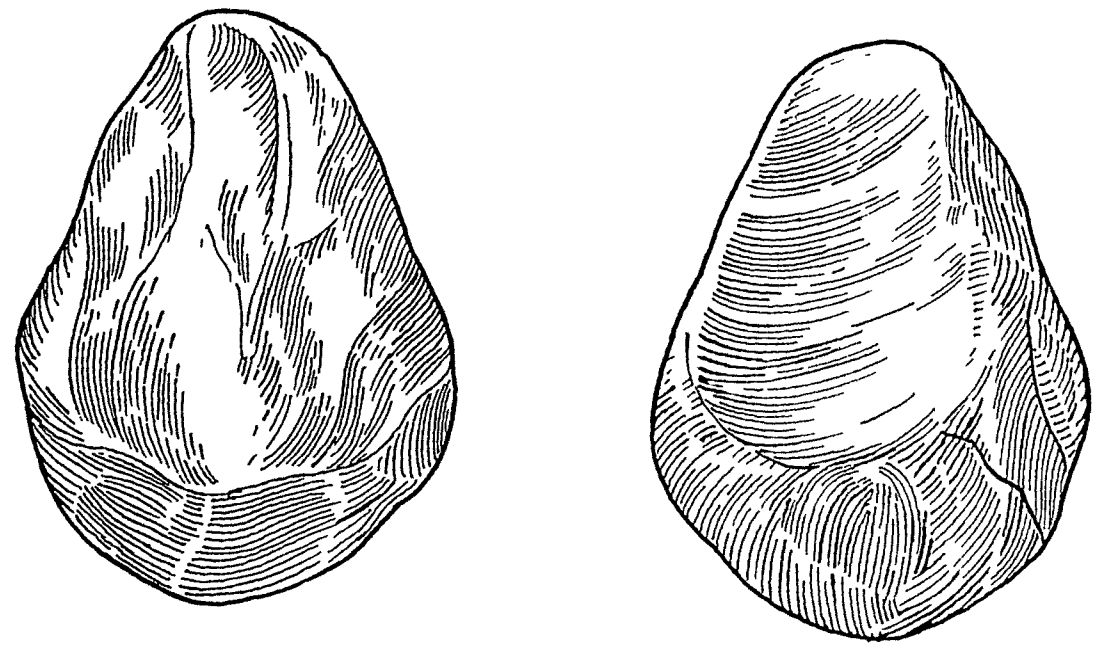

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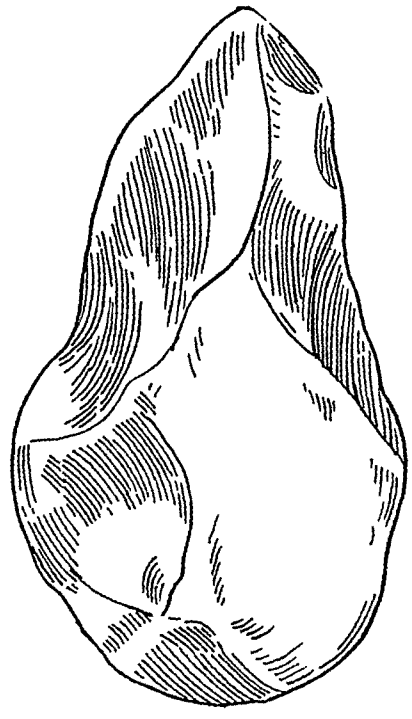

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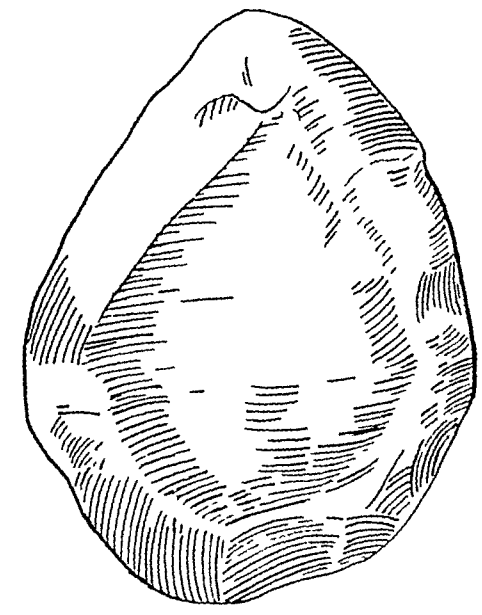

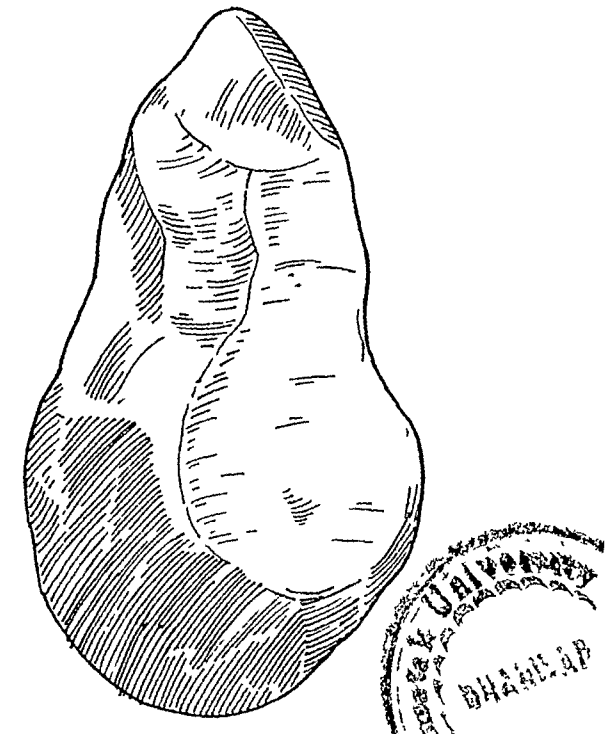

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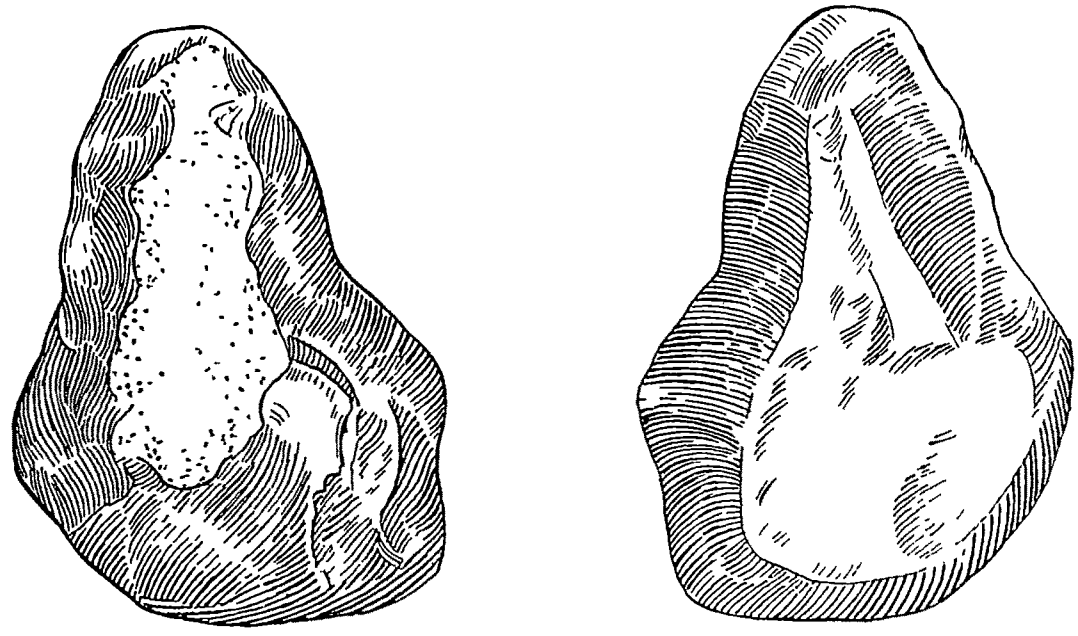

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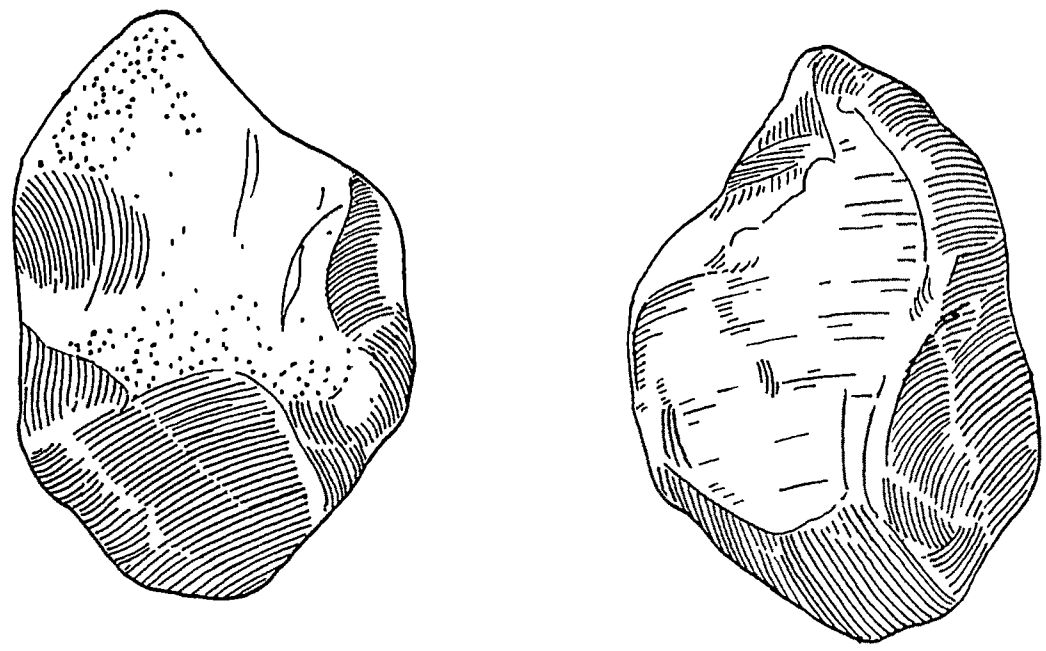

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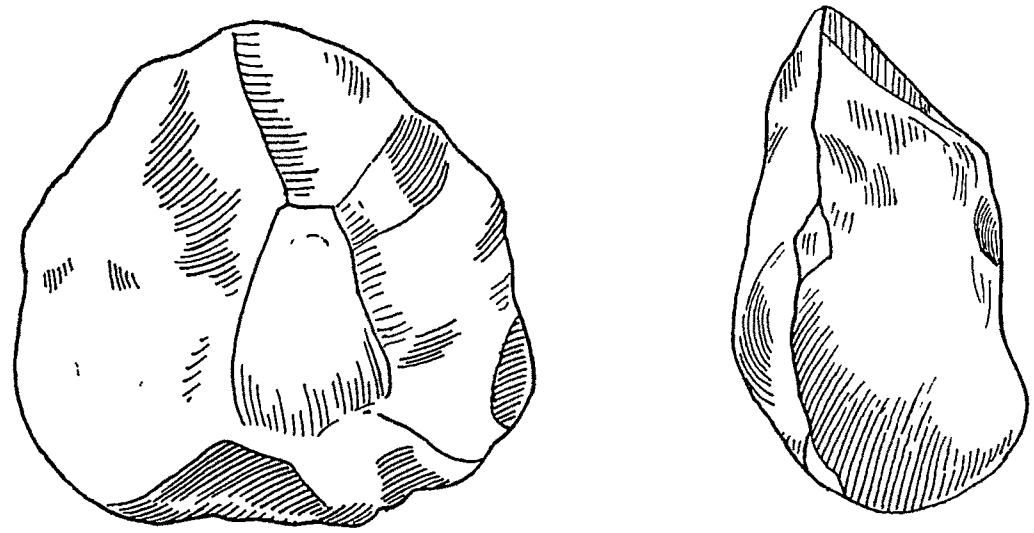

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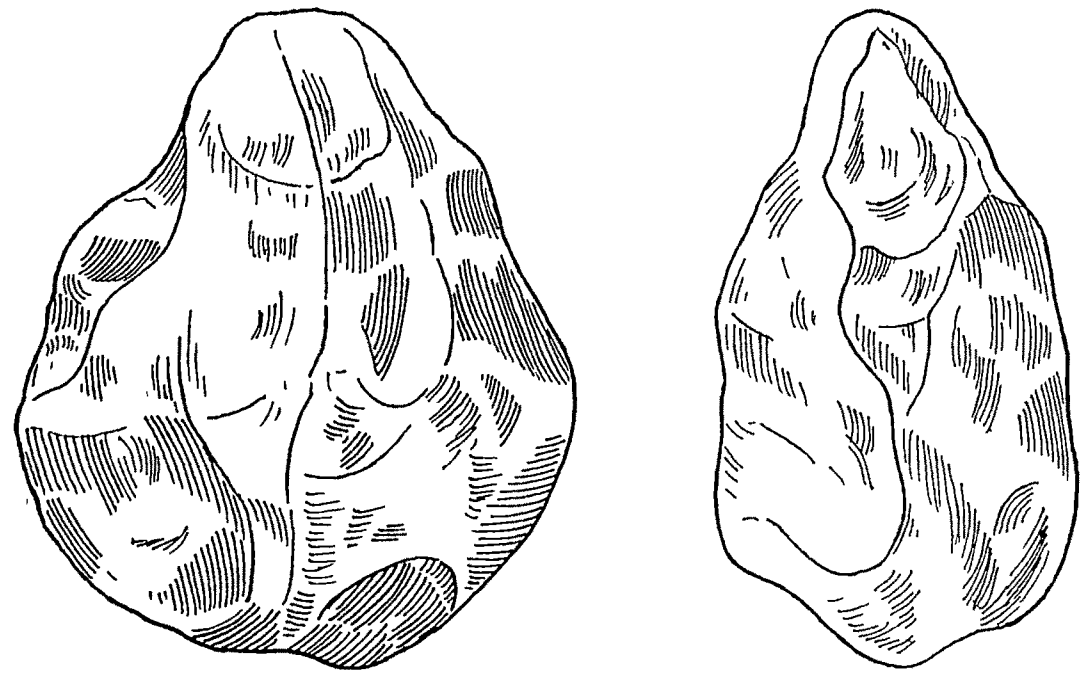

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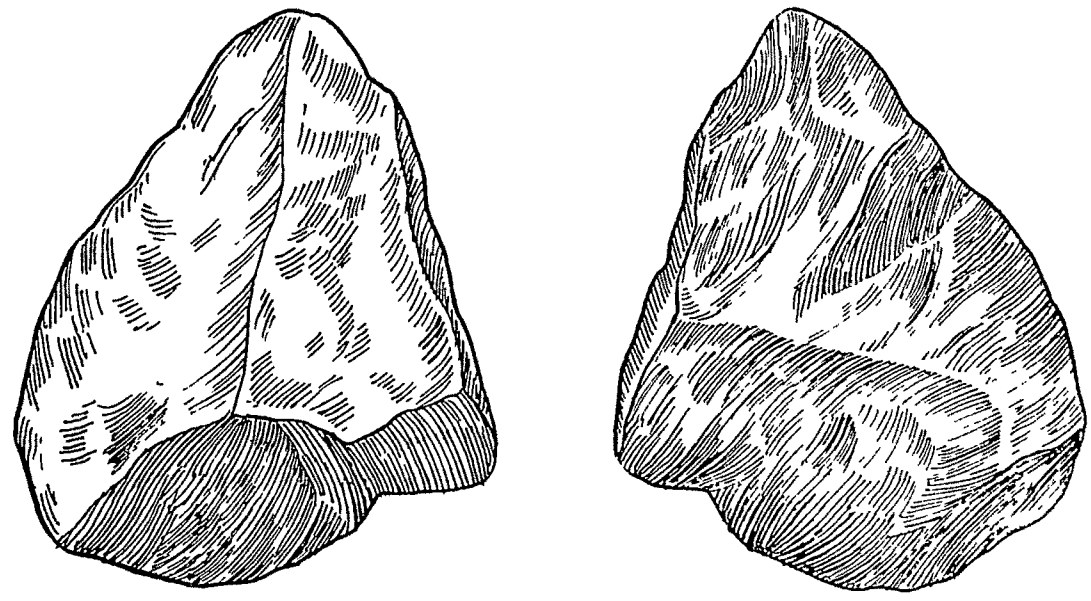
FIG. IV : HAND AXES ON FLAKE



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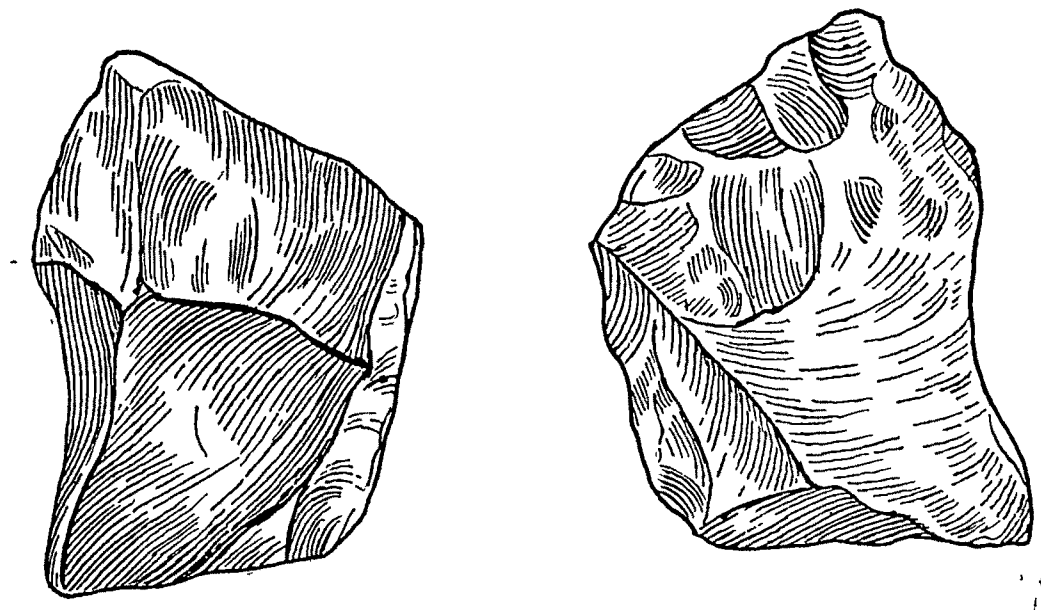

BHARWAD.

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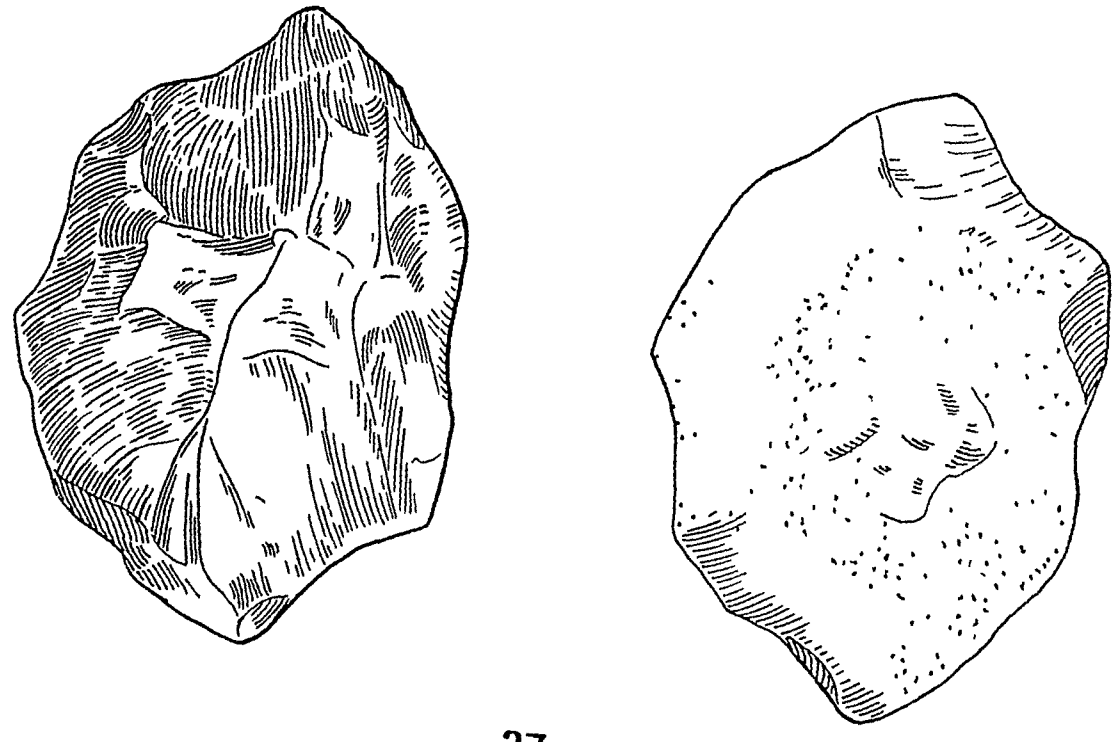

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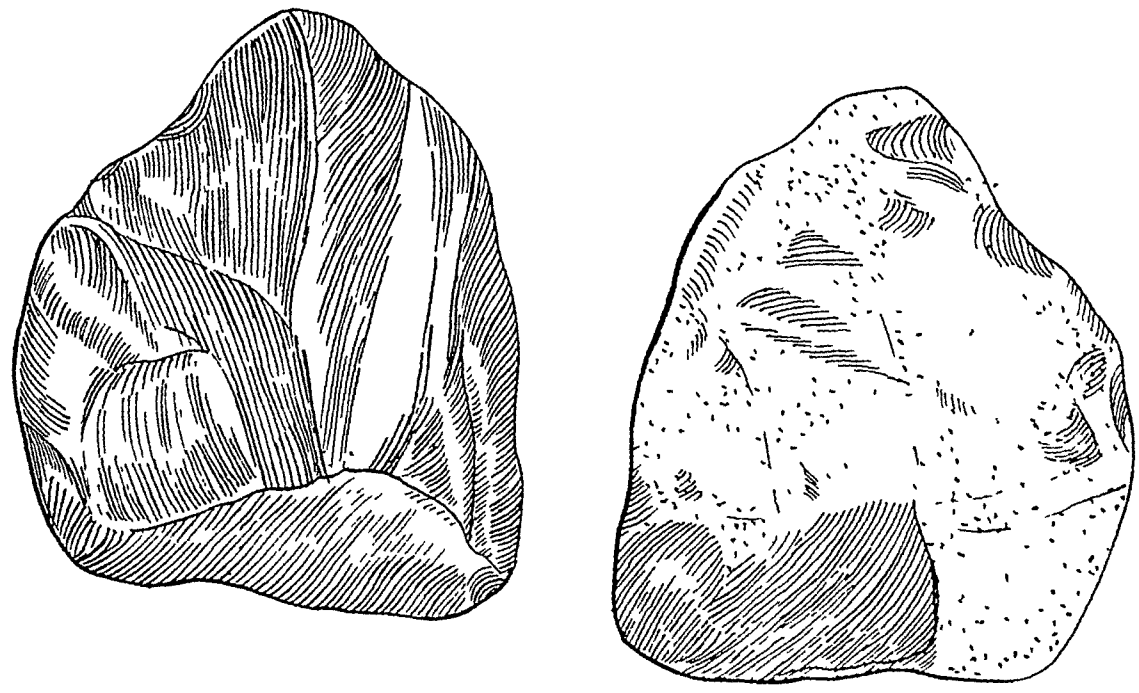

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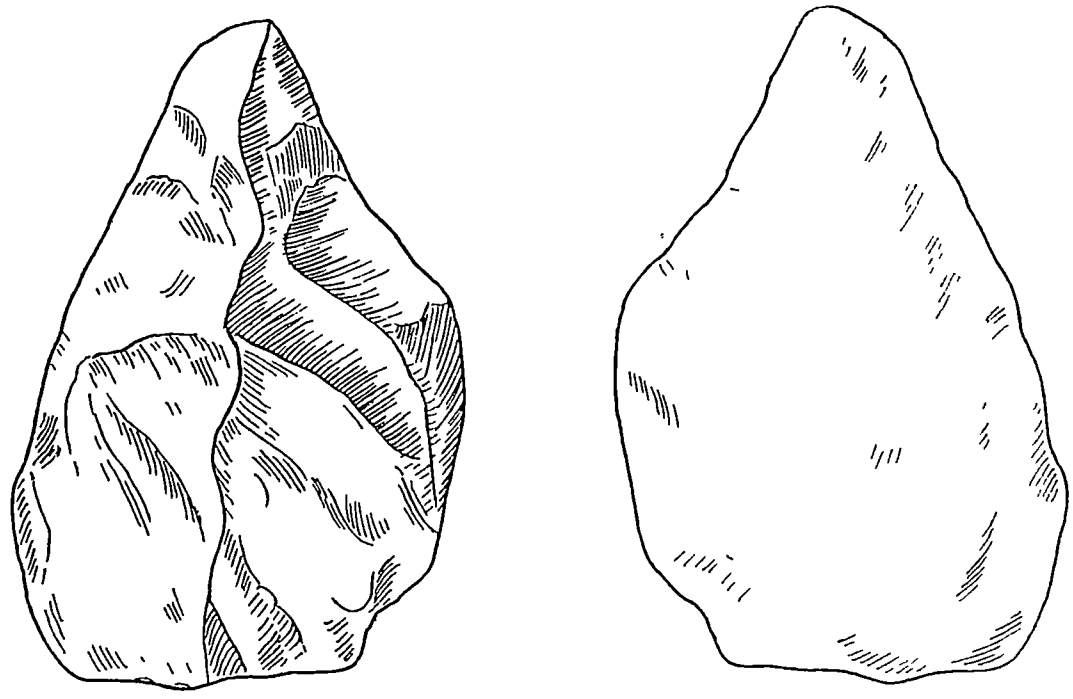

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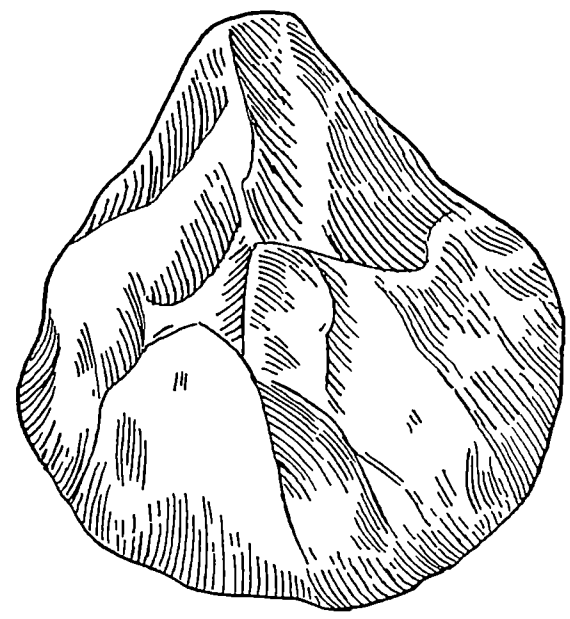

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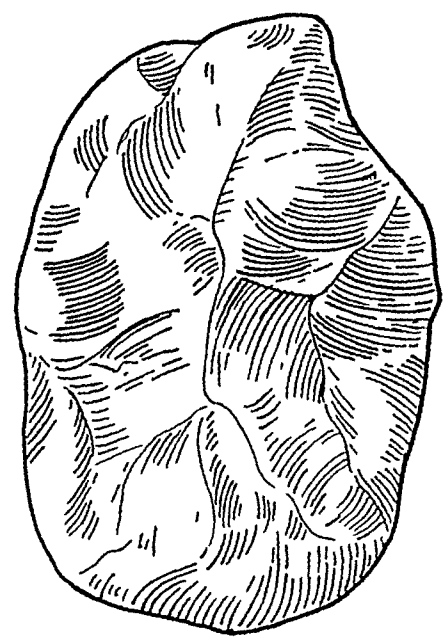

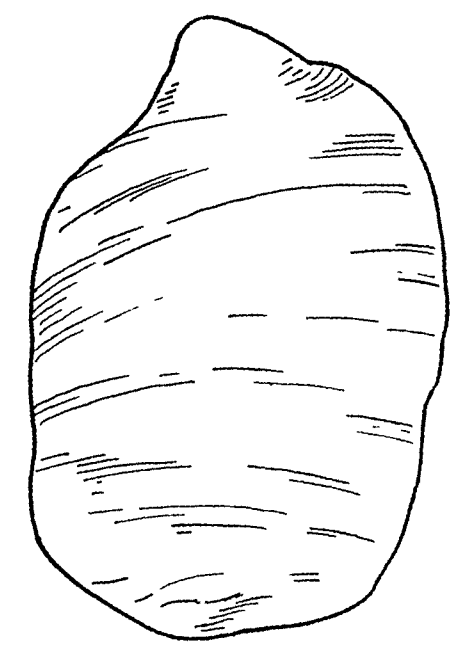

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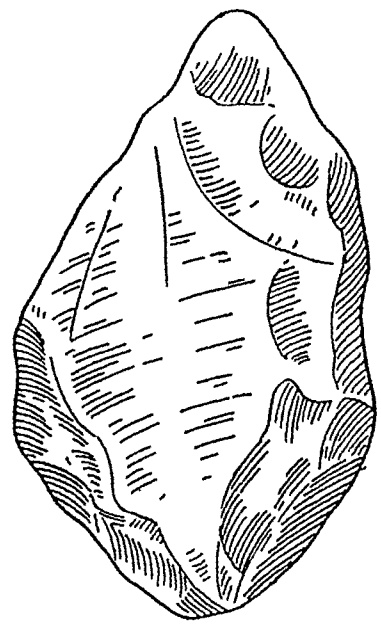

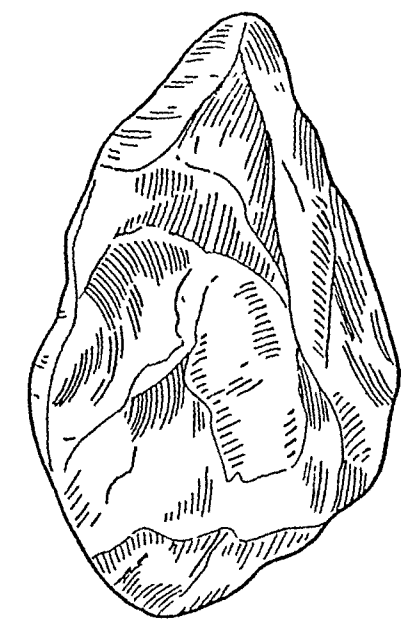

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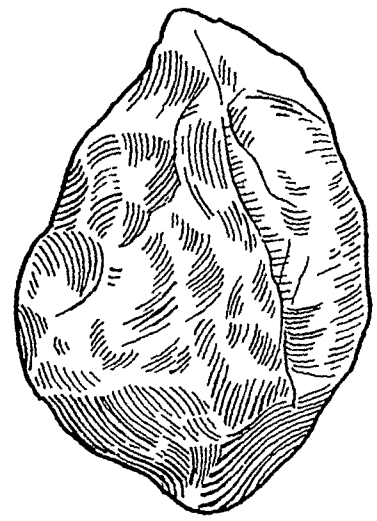

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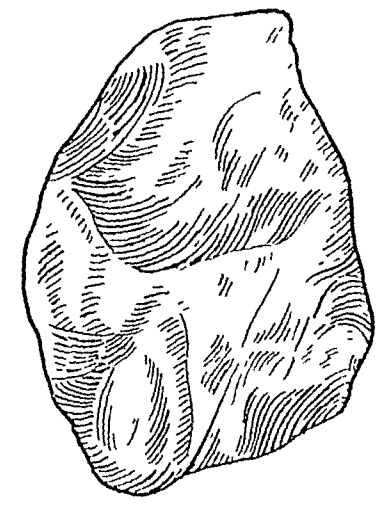

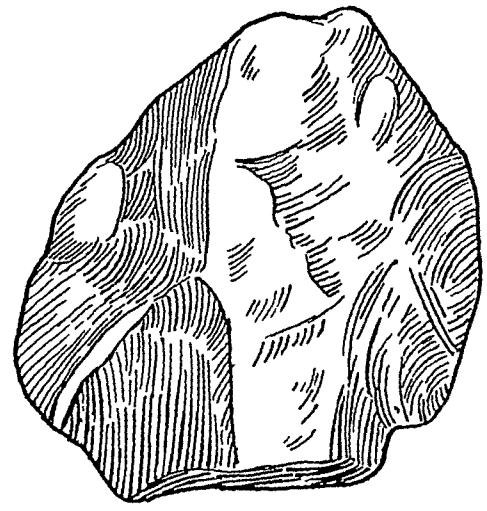

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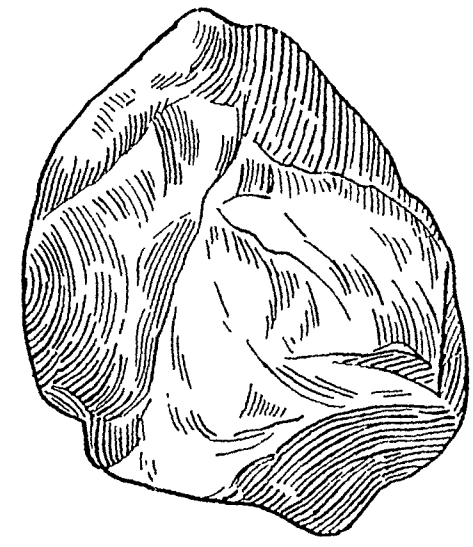

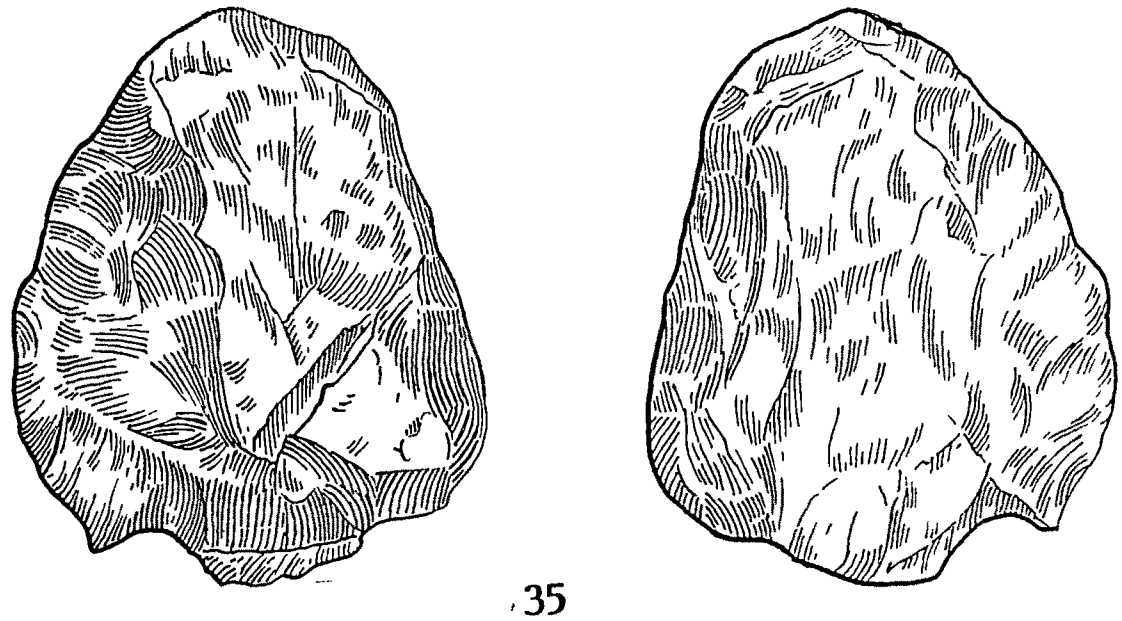

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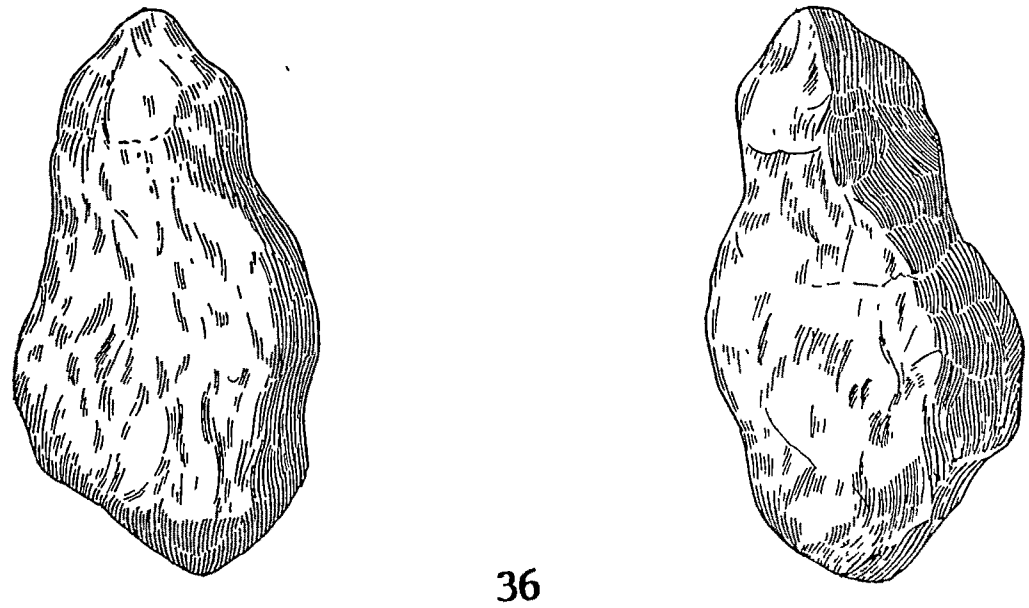

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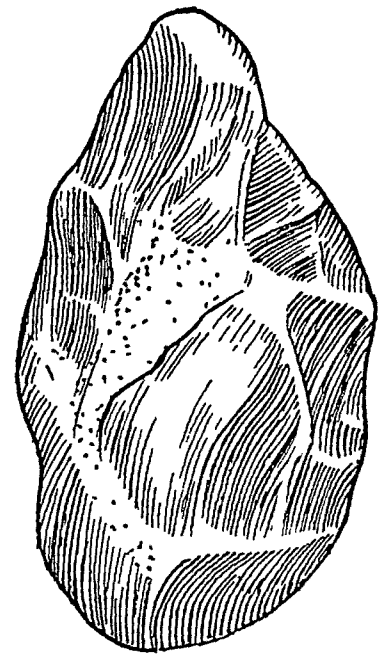

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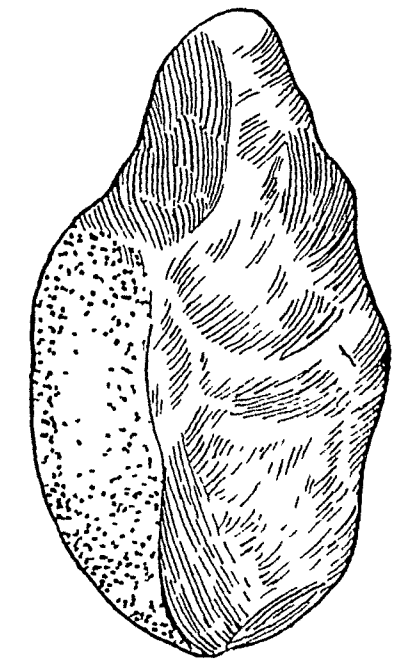

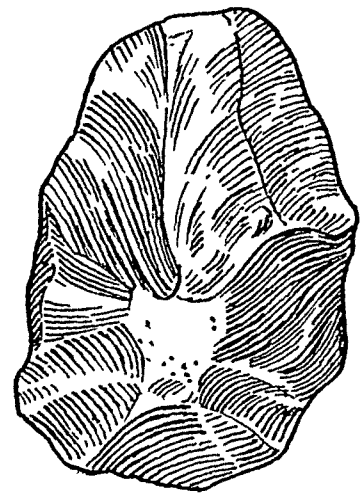

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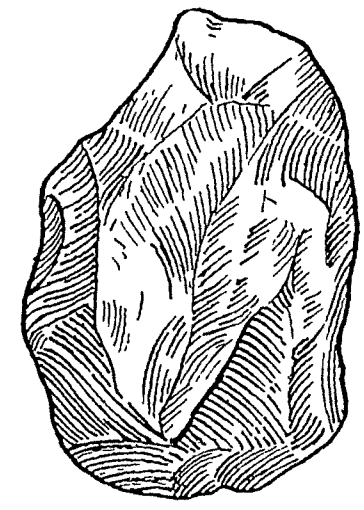

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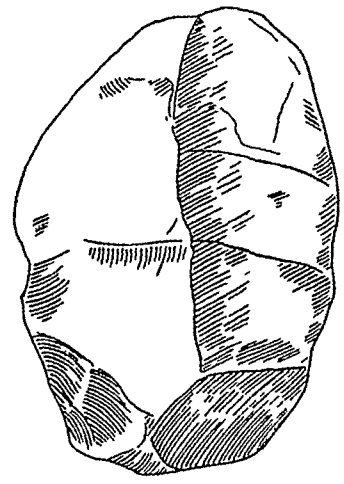

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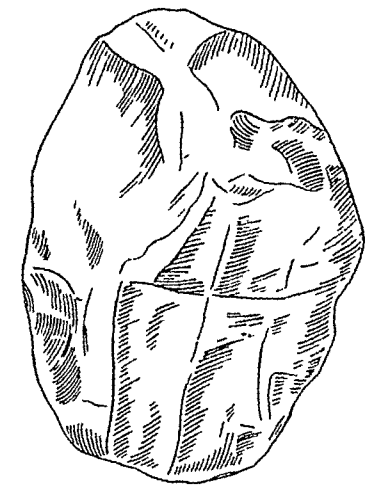

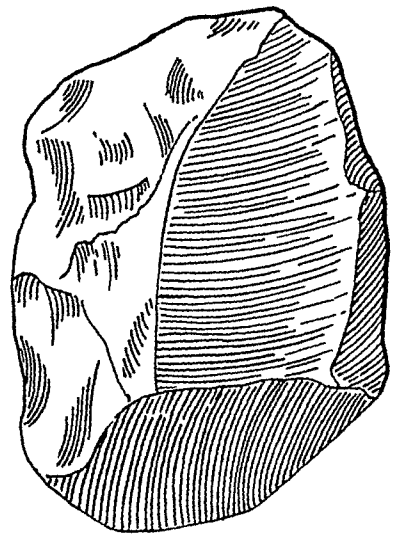

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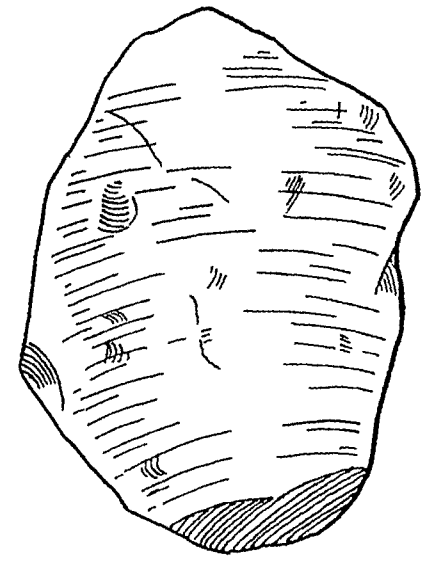

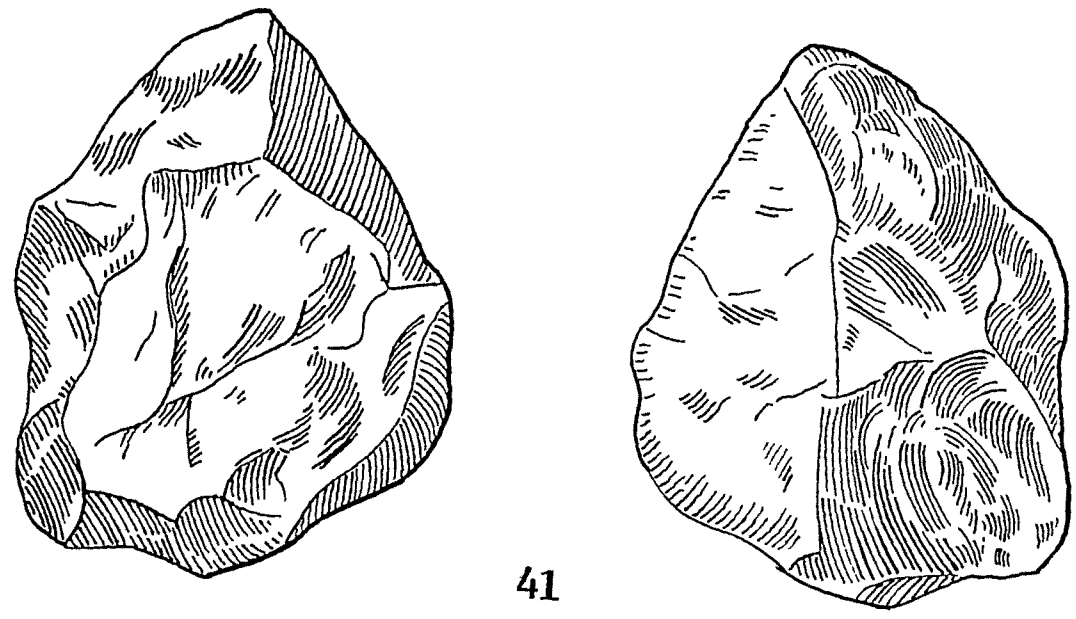

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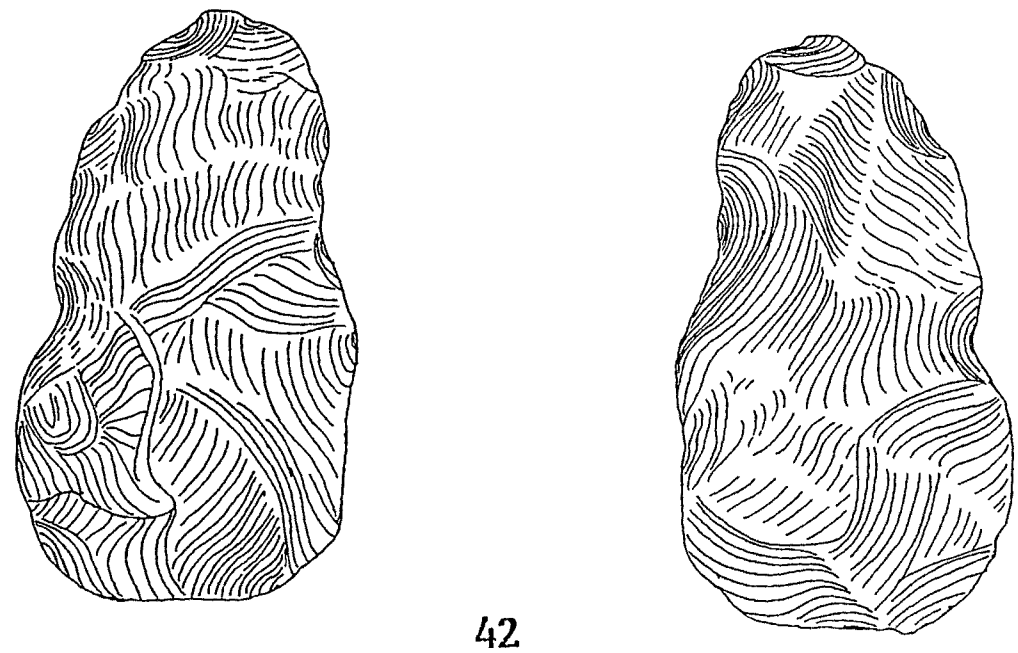

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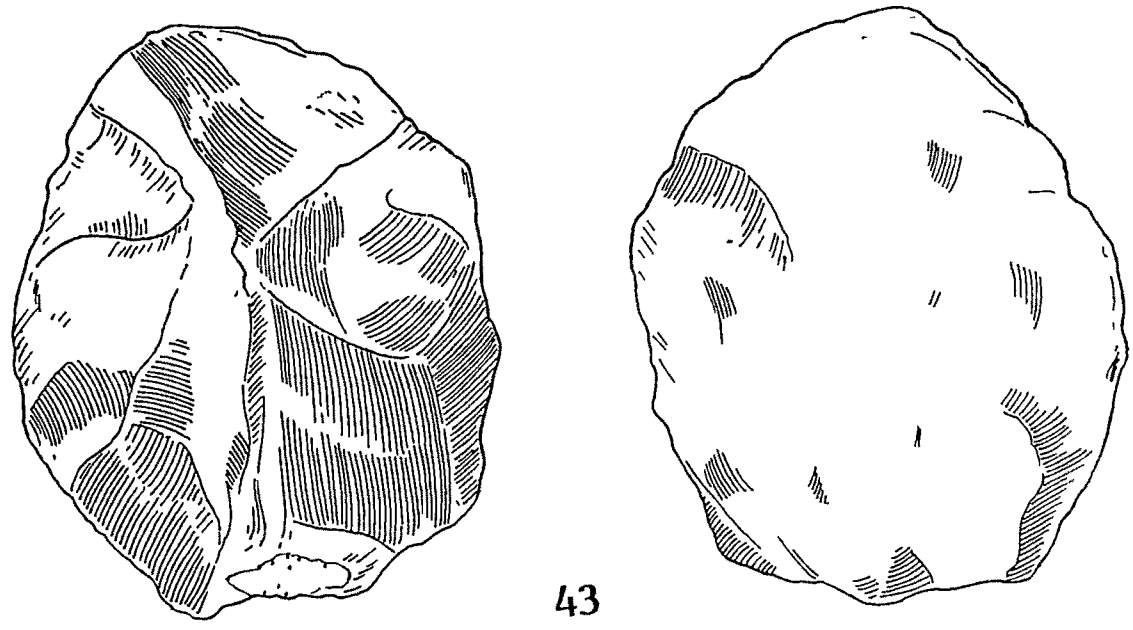

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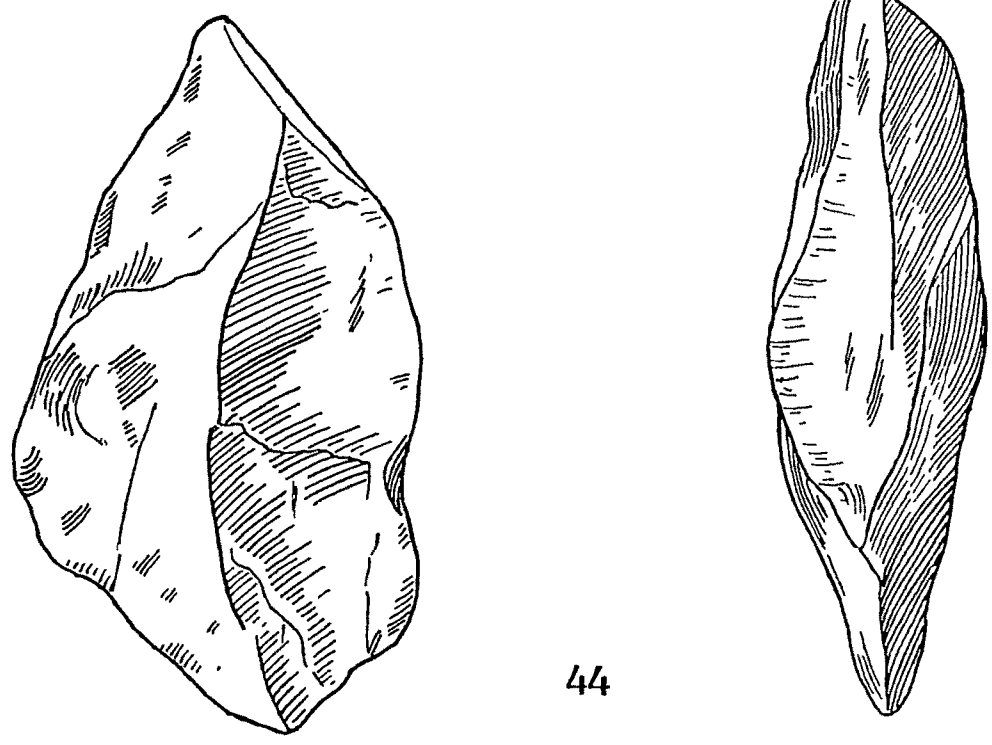

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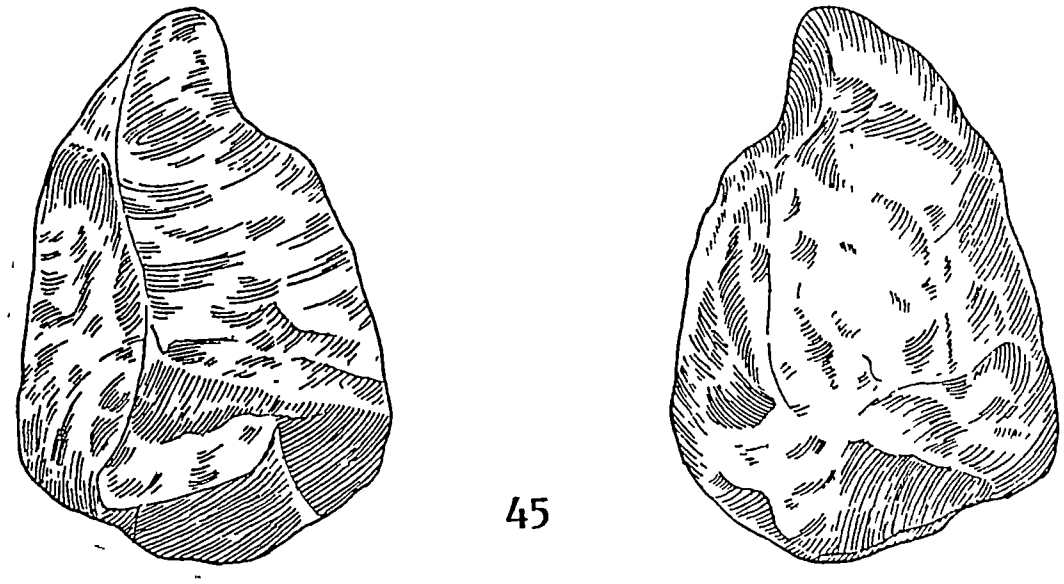

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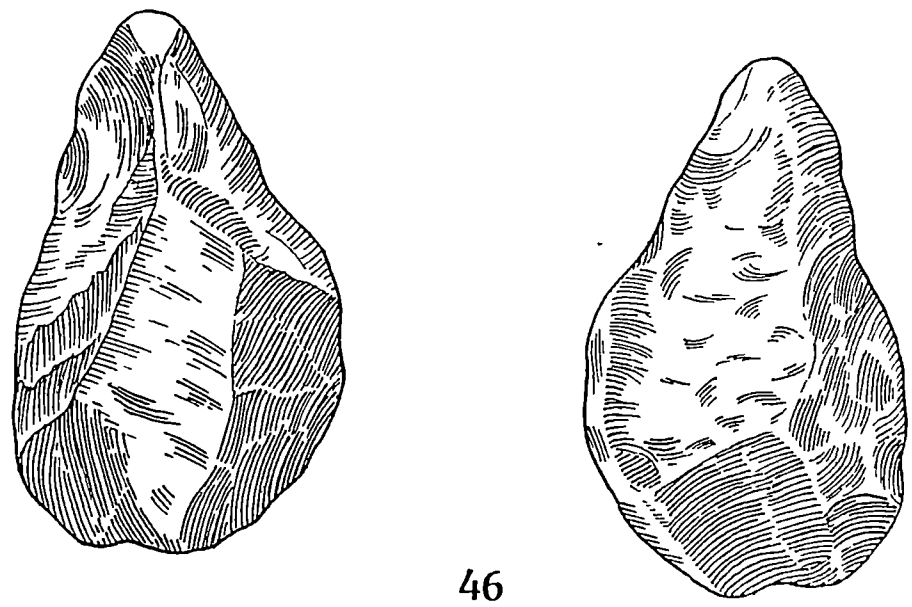

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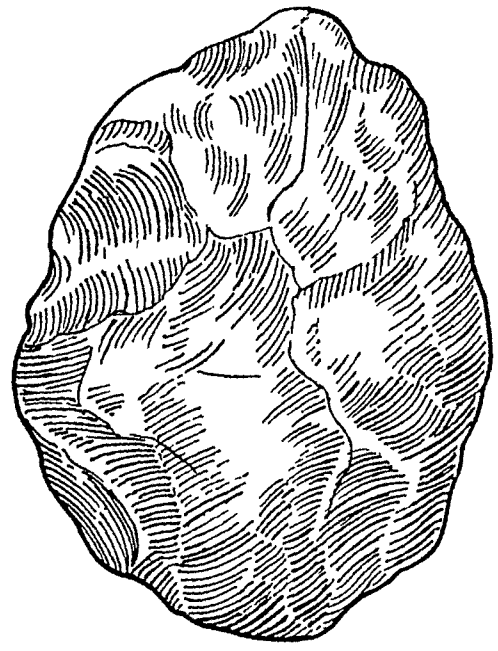

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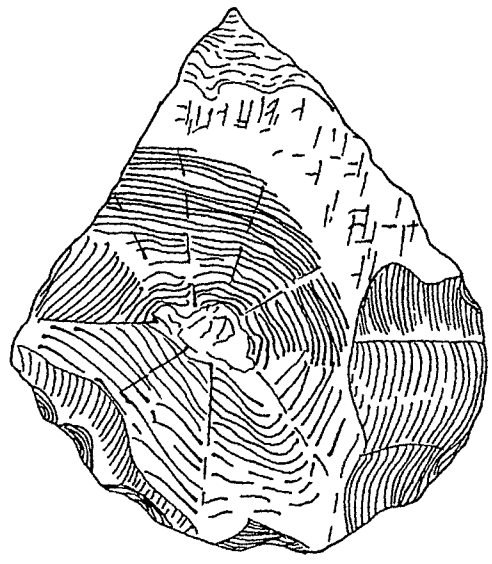

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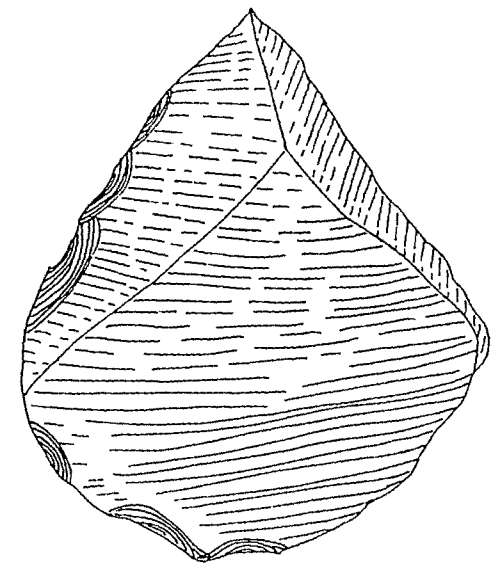

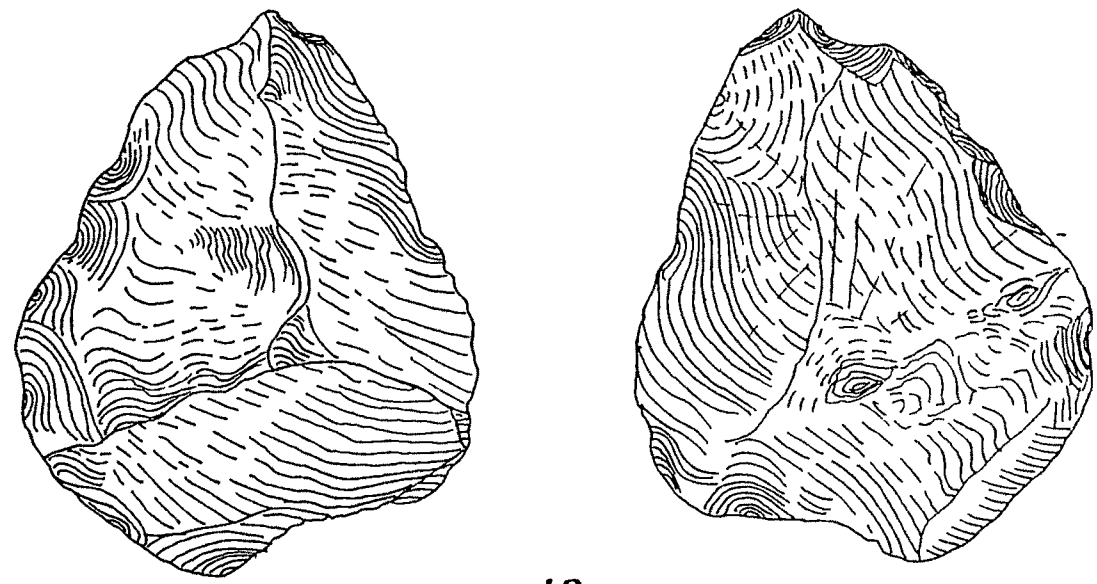

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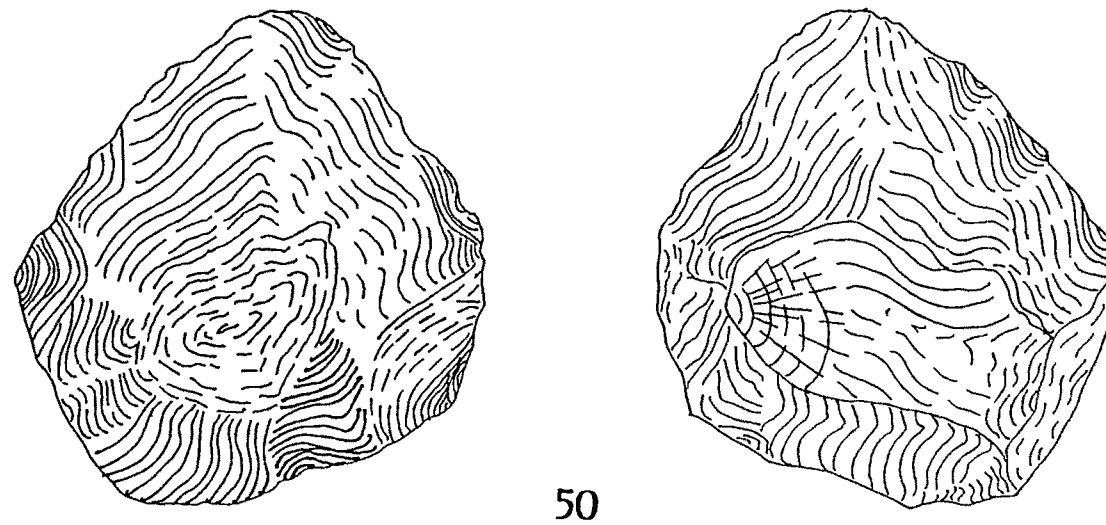

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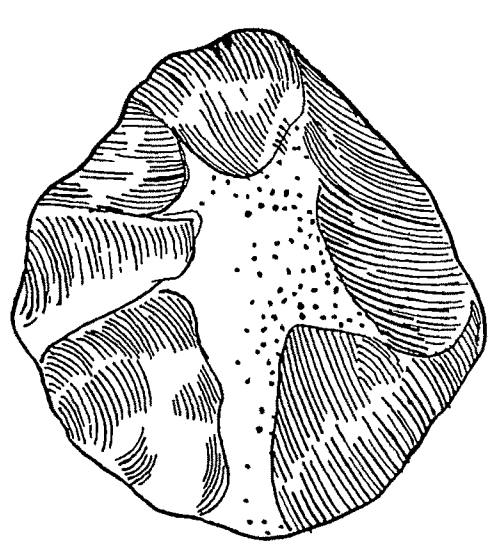
FIG. V : DISCOIDS



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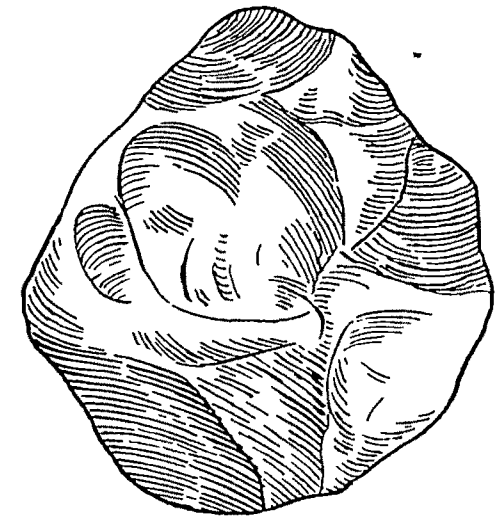

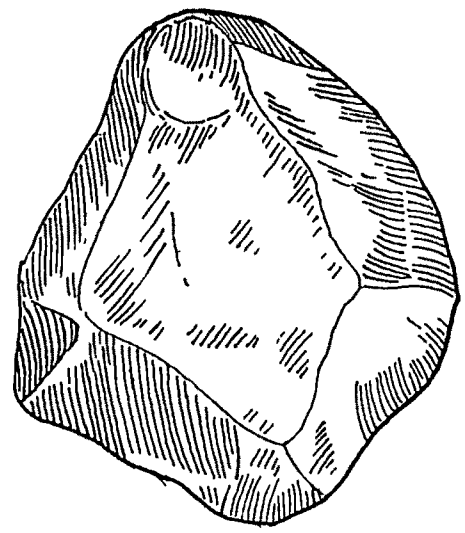

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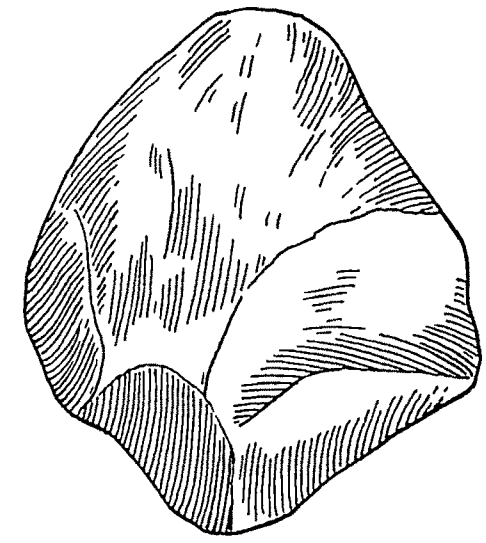

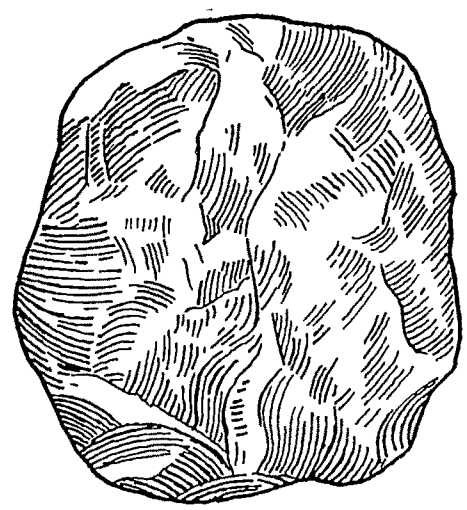

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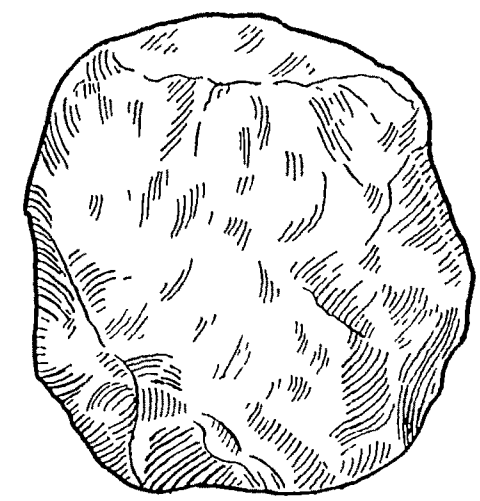

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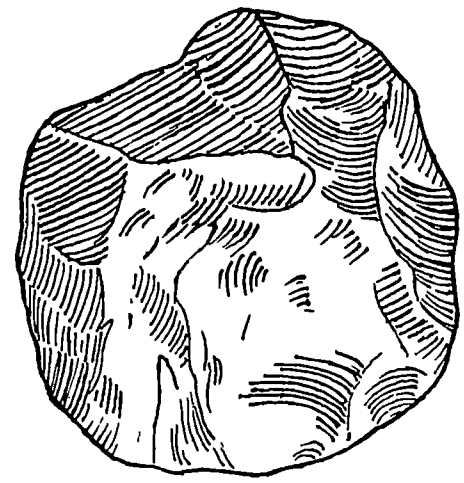

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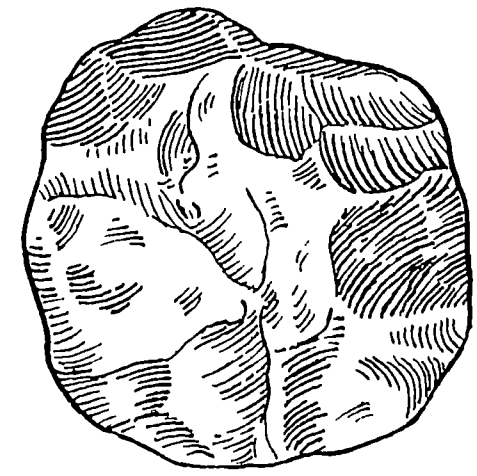

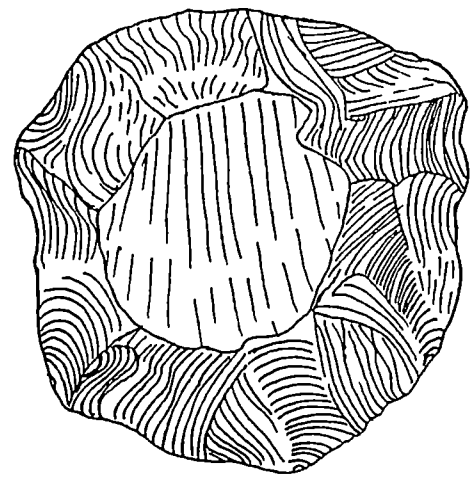

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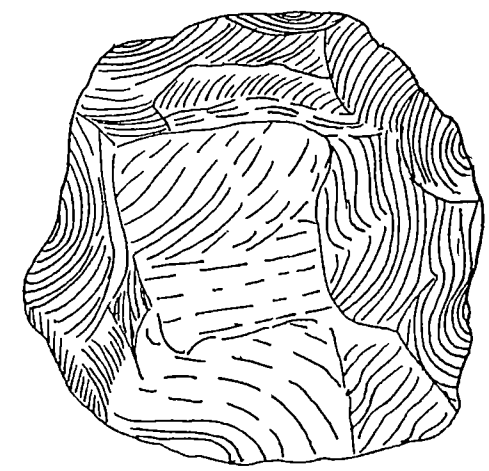

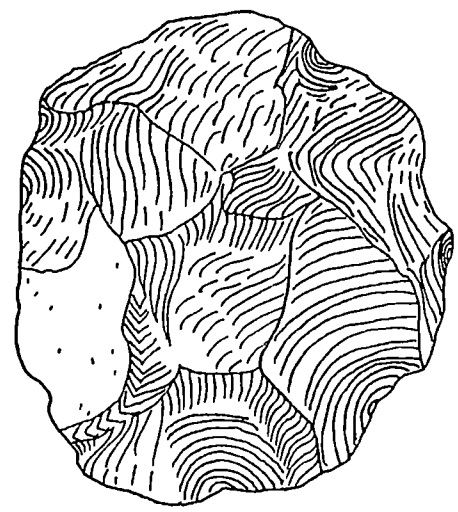

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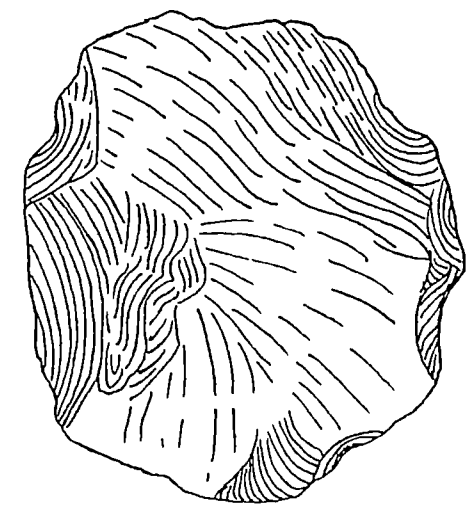

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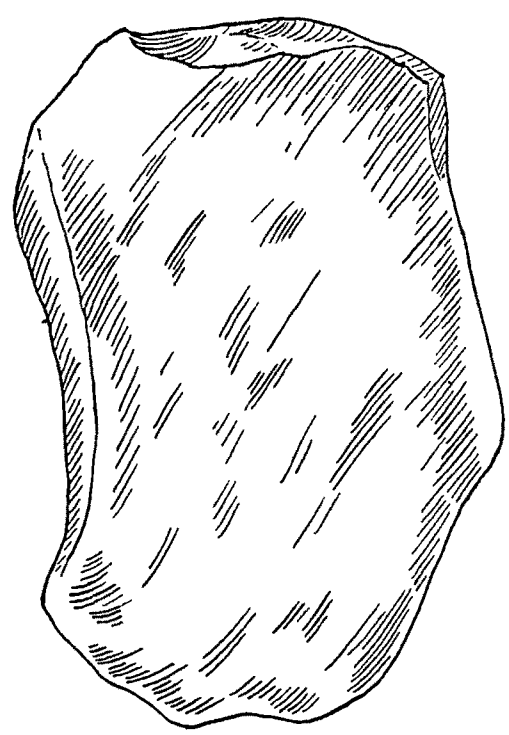
FIG. VI : CLEAVERS



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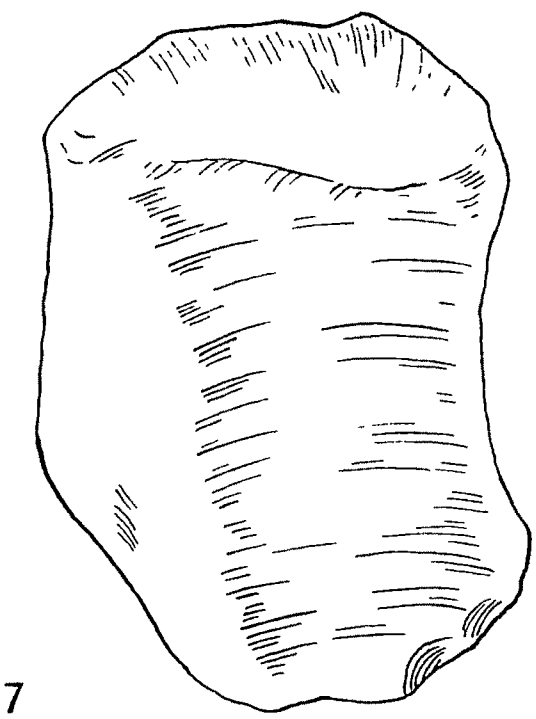

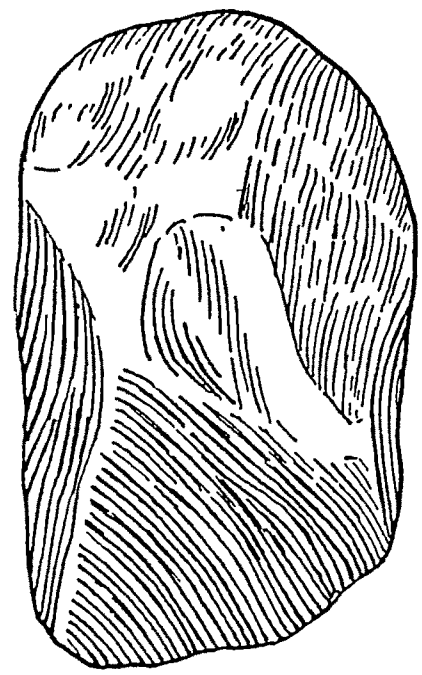

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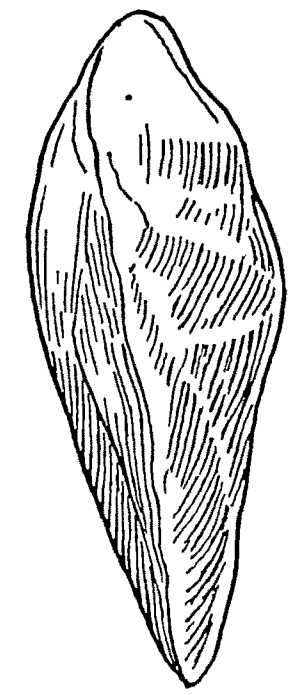

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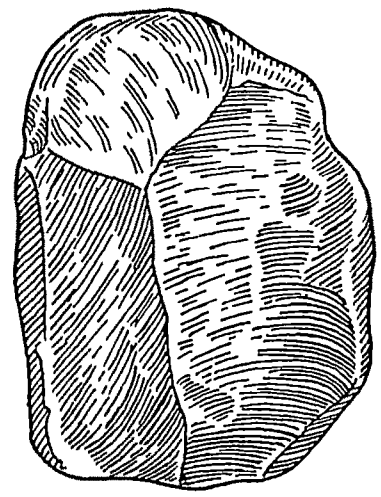
FIG. VII: SCRAPERS



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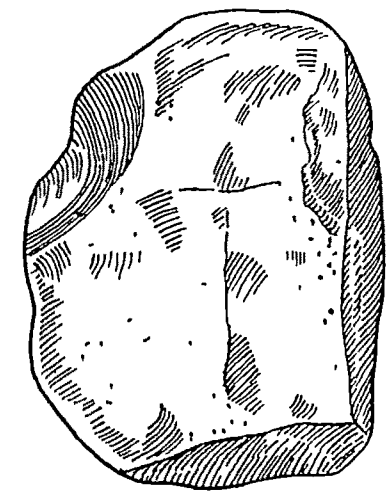

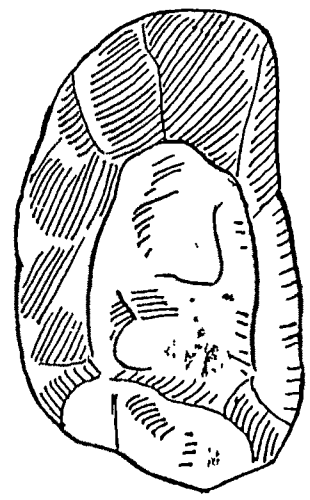

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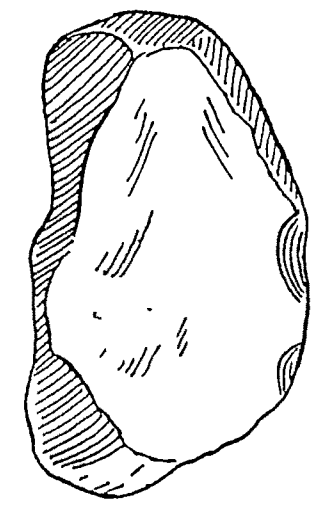

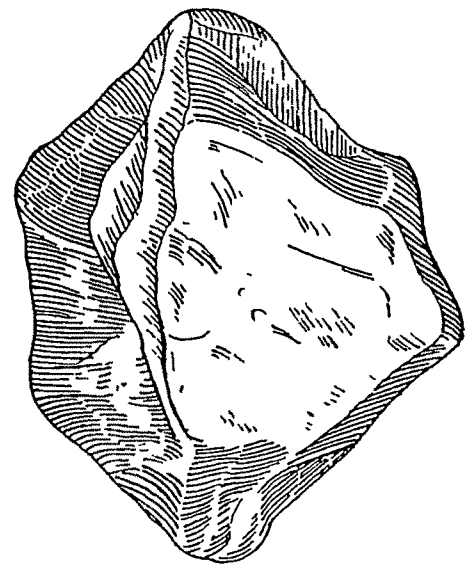

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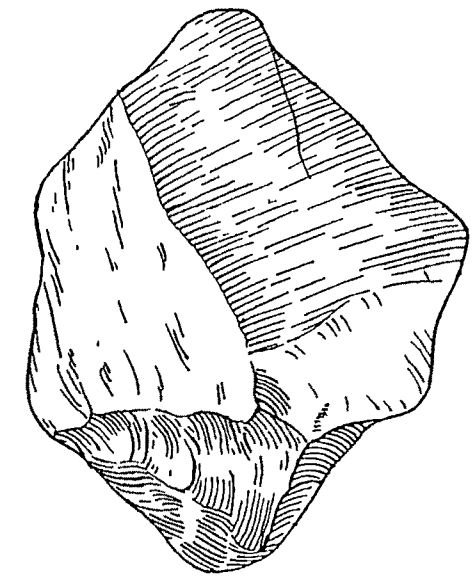

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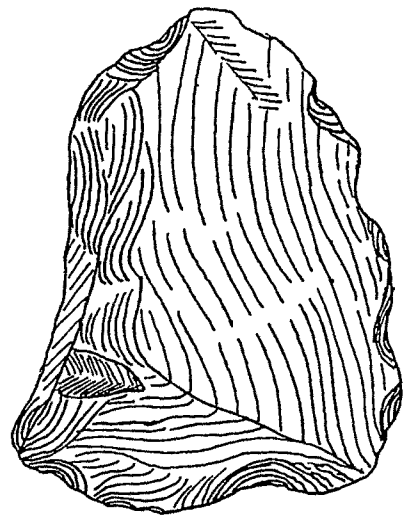

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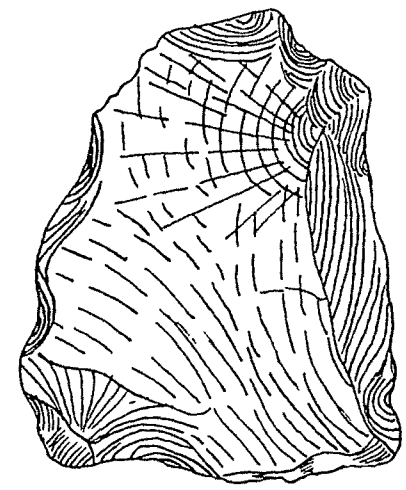

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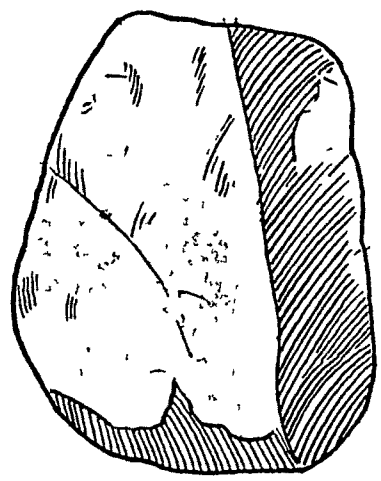

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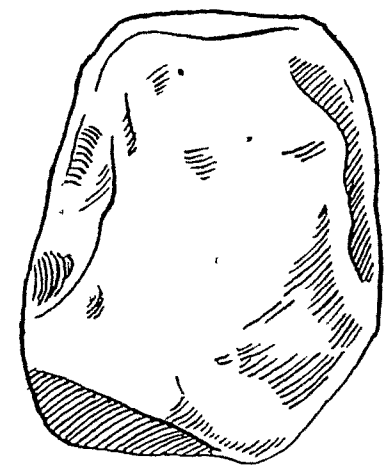

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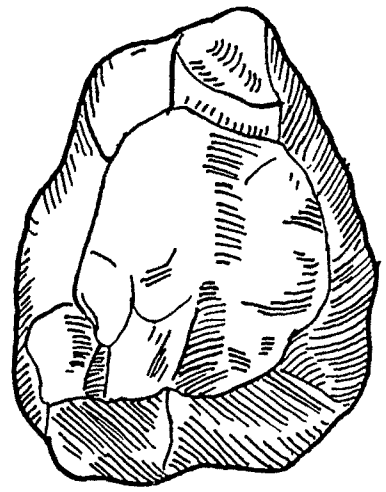

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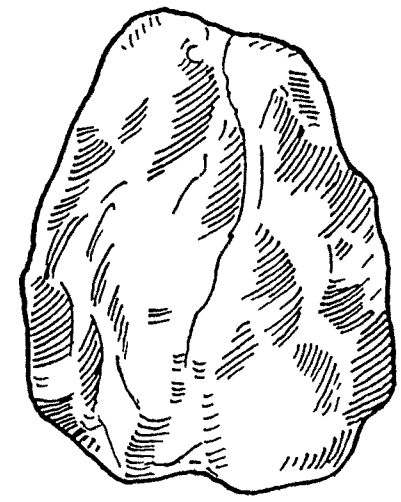

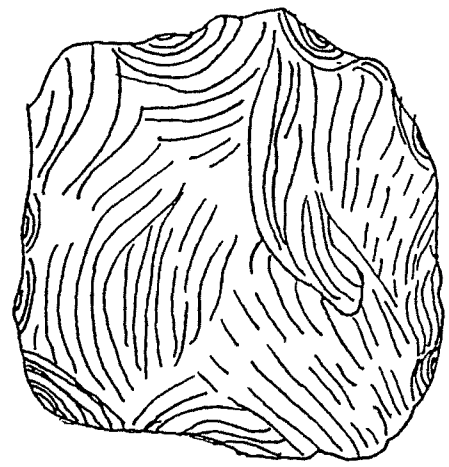

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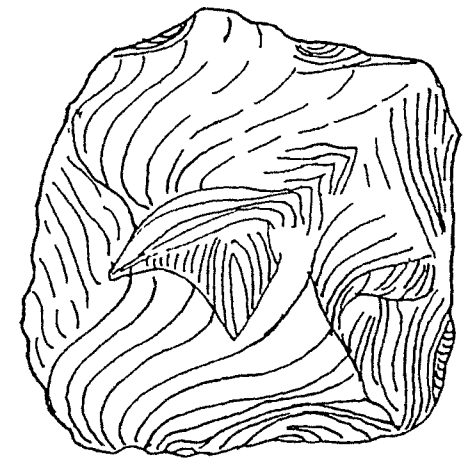

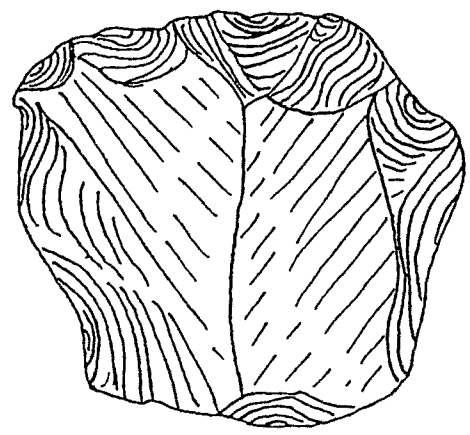

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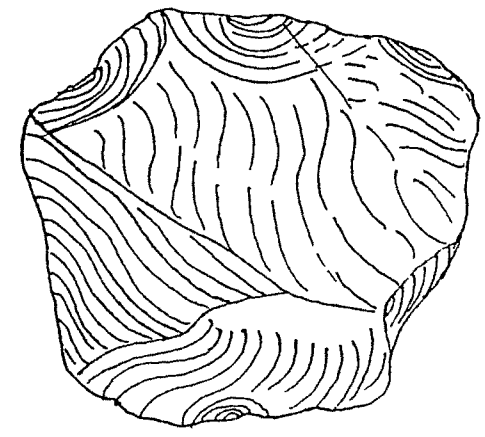

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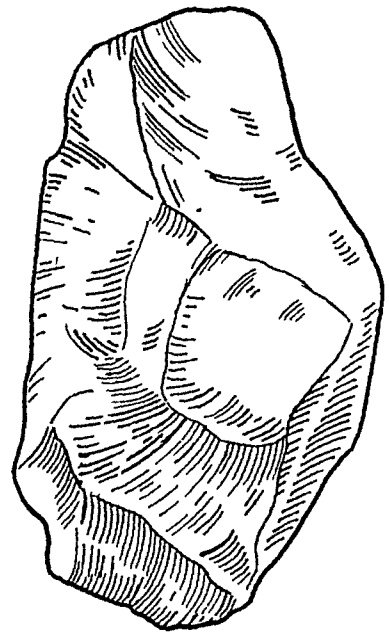

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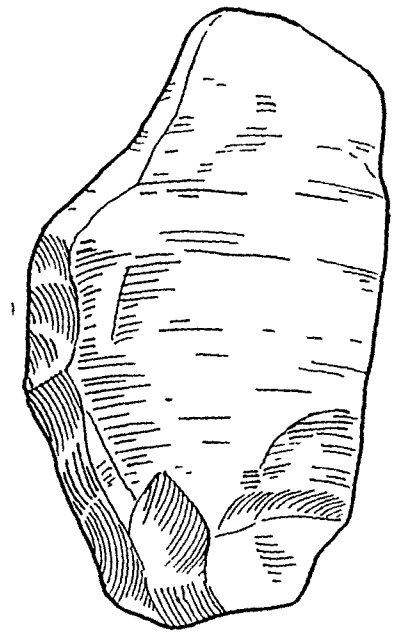

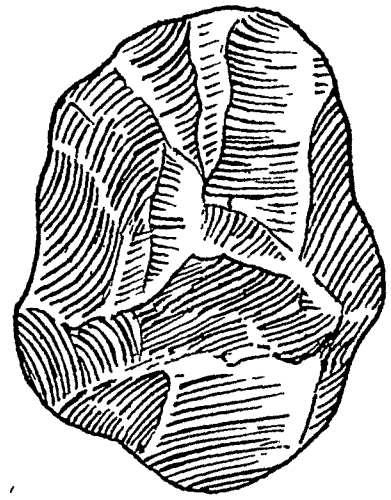

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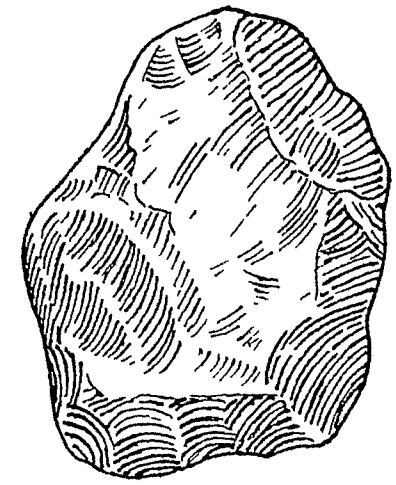

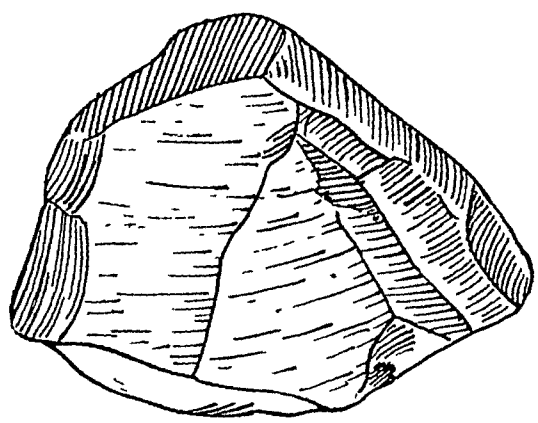

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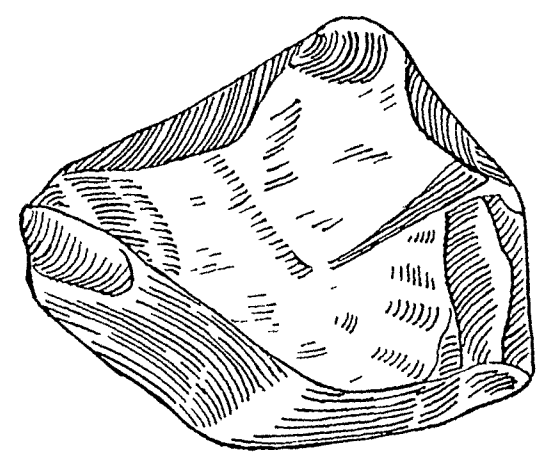
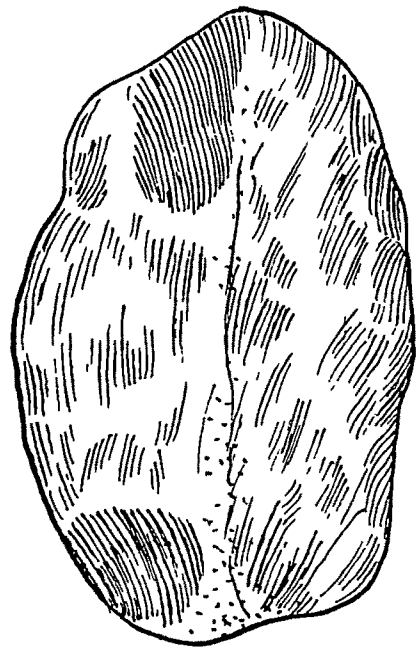


FIG. VIII : POINT GROUP



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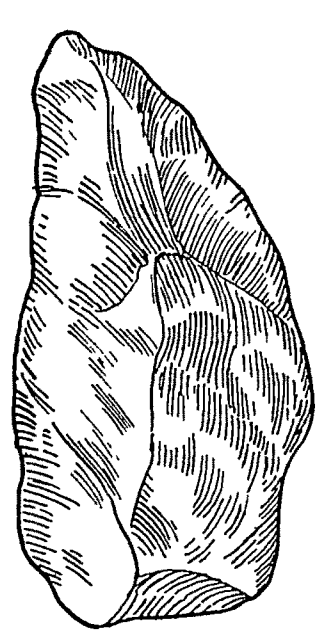

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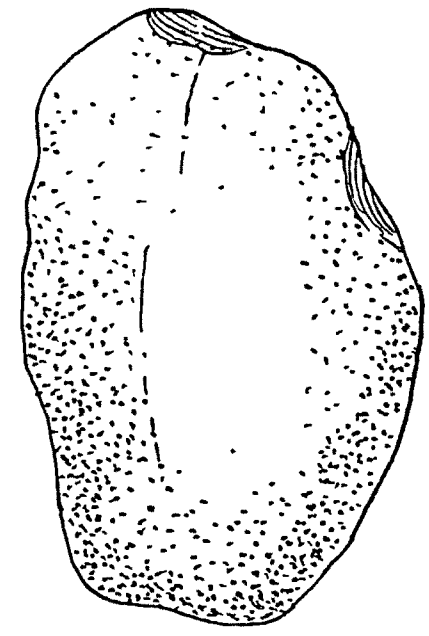

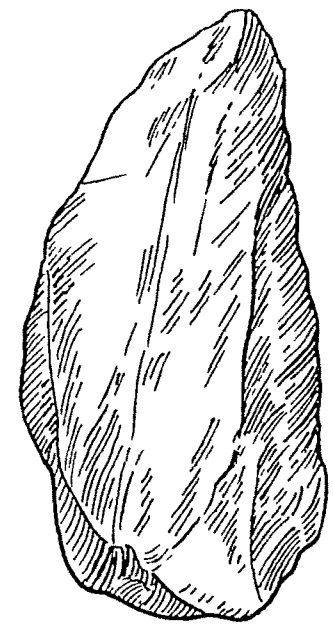

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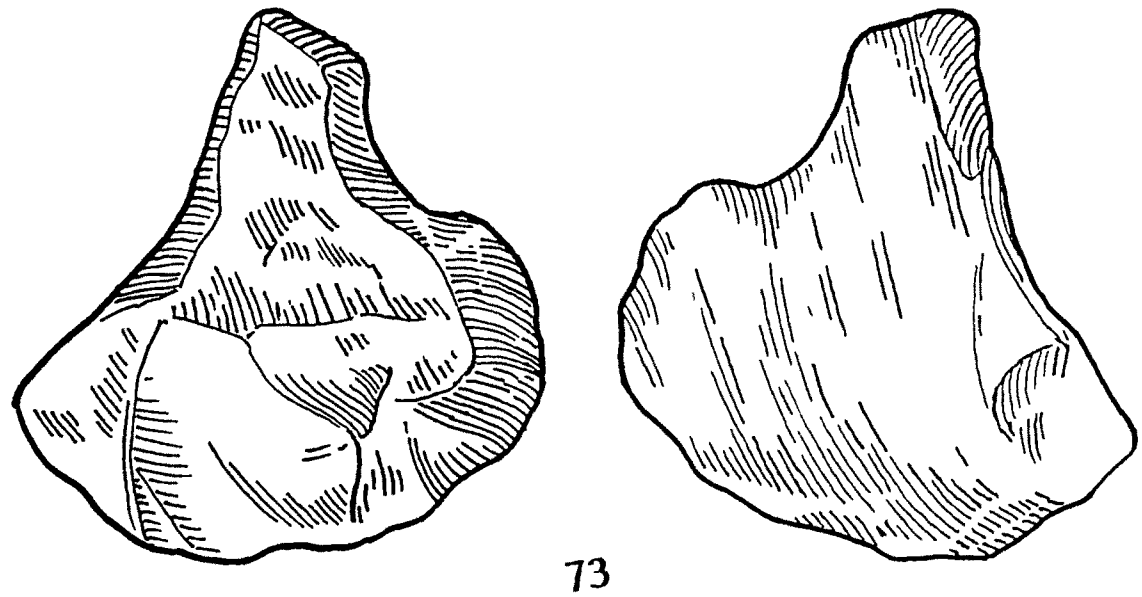

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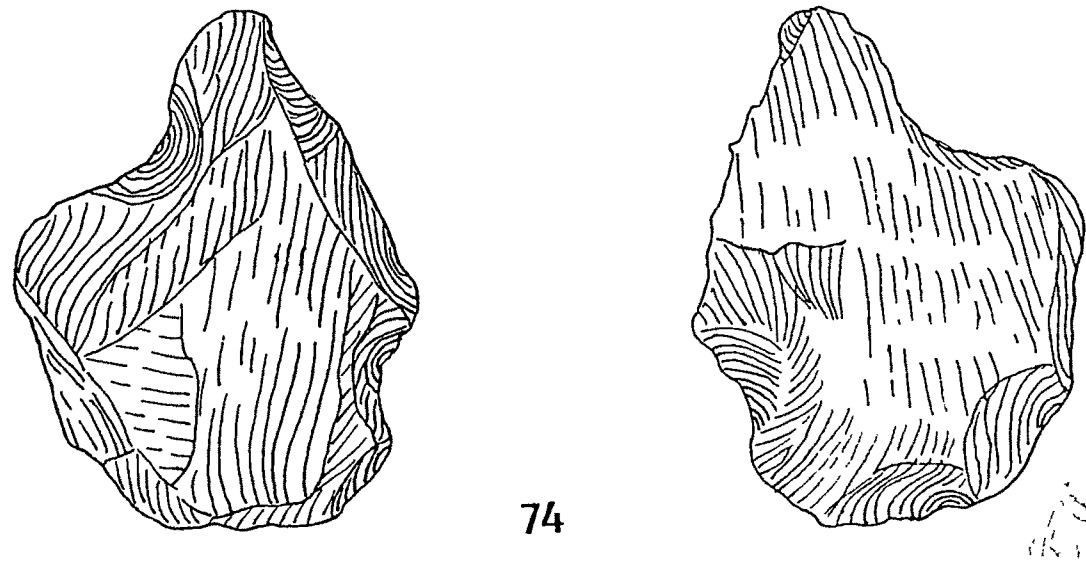

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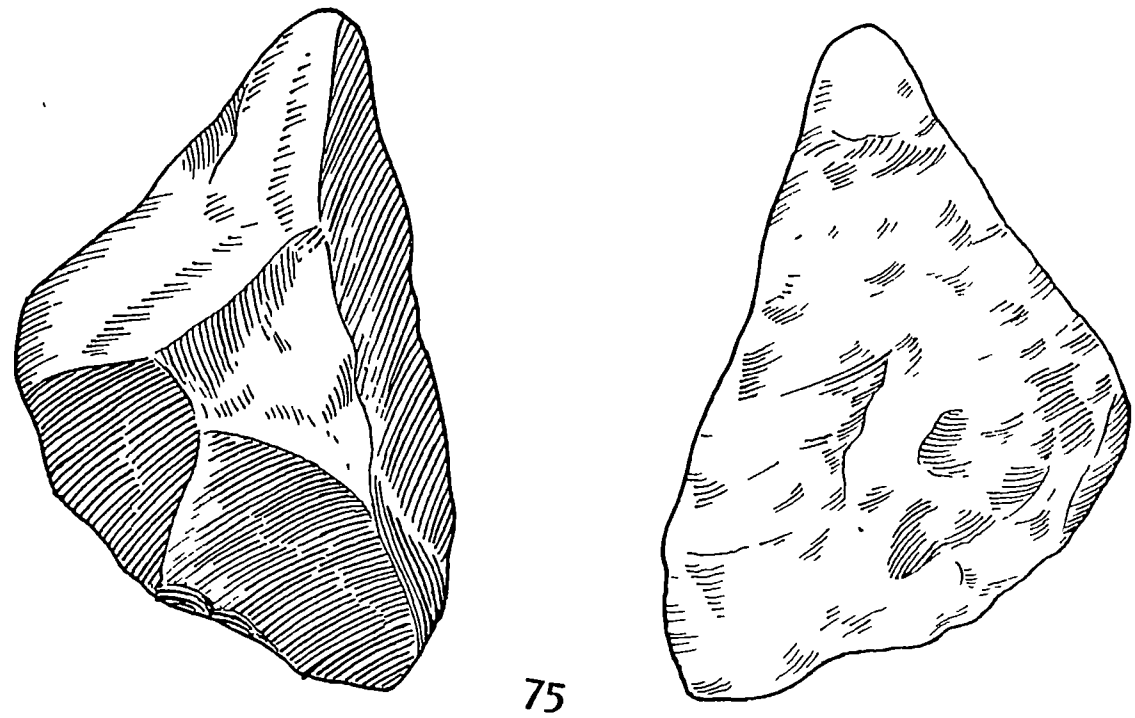

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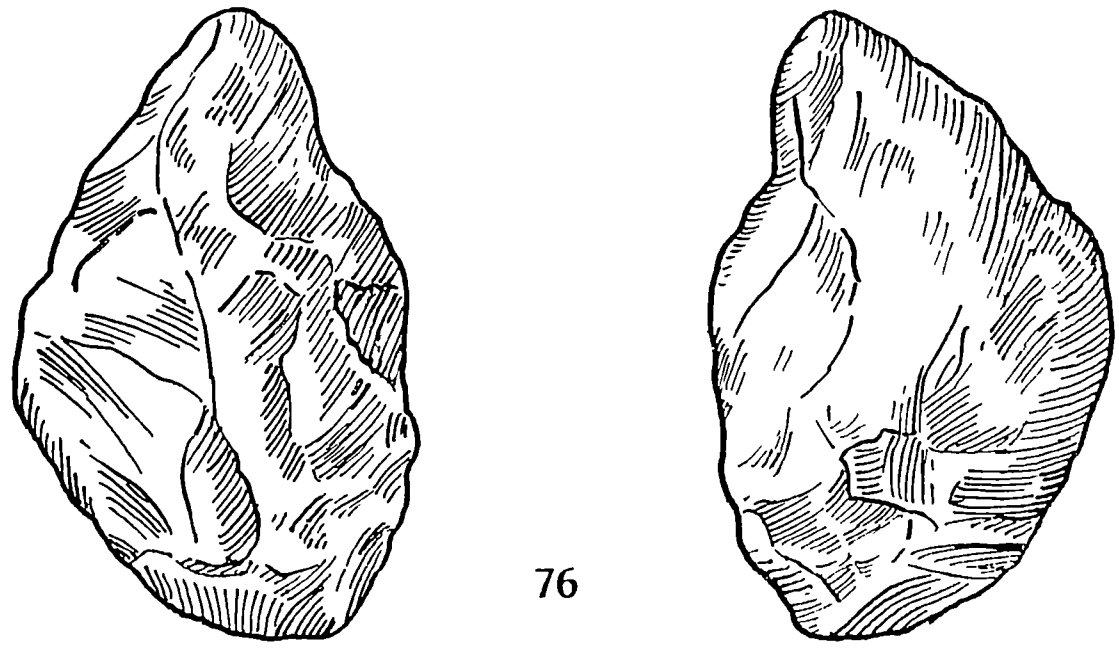

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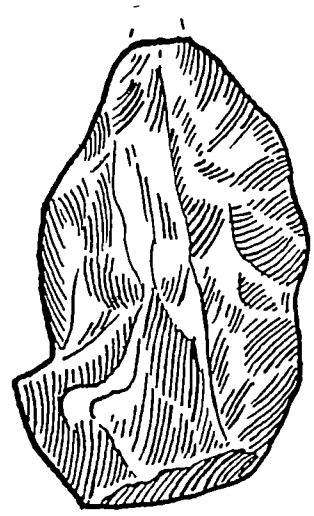

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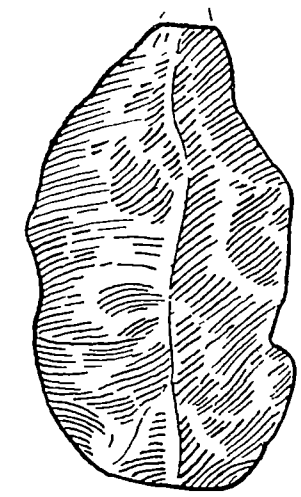

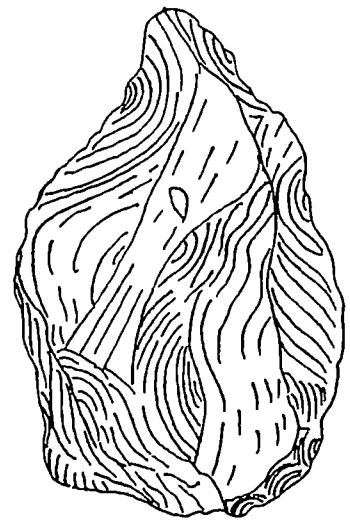

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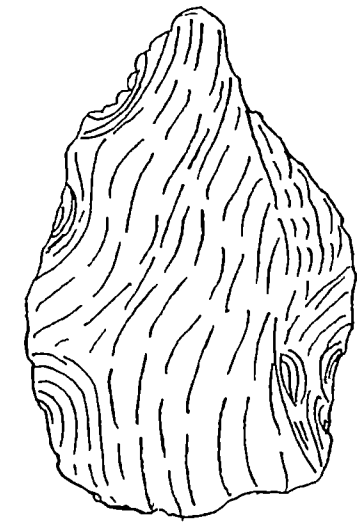

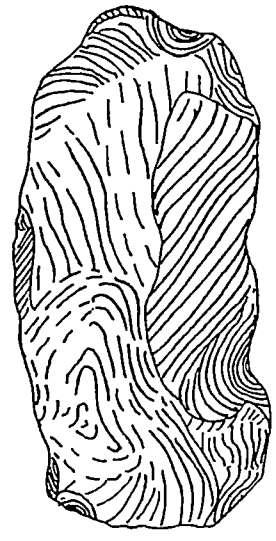

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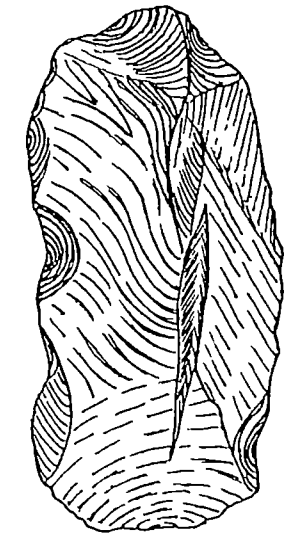

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CHAPTER III

MIDDLE PALAEOLITHIC SITES

On the basis of the rock material, technique, tool type, etc., as early as in 1930, Burkitt and Commaide classified the Palaeolithic assemblages noticed in Kurnool and other areas as series I to IV. These are supposed to indicate the sequence of Palaeolithic cultures. Studies by K.R.U. Todd (1939), Deterra and Patterson (1939) confirmed Burkitt's classification. Nevertheless this supposed sequence was not stratigraphically confirmed. It is in this context the work done by Sankalia at Nevasa, in the Pravara basin (1956) has been the most important for, his studies established the stratigraphical position of Middle Palaeolithic in India; besides typological classifications have brought out salient features of this culture. Since then, a number of sites spread all over the Indian subcontinent have been reported by many scholars. Some of the important sites and river valleys where this culture is noticed are Marwar and the sites in the Luni valley in Rajasthan (Misra, 1968); in the terraces of the river Bhadar, Saurashtra (Sankalia, 1974), Maheshwar (Sankalia, S. Rao and S.B. Deo, 1958), Mandsor and Nahargadh in Shivna valley (IAR, 1959-60), Siroha sites in Betwa, Sonar, Kopra and Narmada valleys (Sankalia, 1974), Bhimbetka in Madhya Pradesh (Khatri, 1962), Lachura (Pant, 1982) and numerous sites in the Belan and Son valleys in Uttar Pradesh (Sharma, 1980); sites in Patna, Gaya, Bhagalpur districts in Bihar (IAR, 1960-61, 63-64, 65-66), sites in the tributary of the river Brahmani, sites in the Mayurbhanj and Sundargarh districts and Harichandanpura, Dhenkanal district in Orissa (Sankalia, 1974); sites in the western districts of West Bengal (IAR, 1959-60), sites in Romgrom valley in Assam (Sankalia, 1974), sites in Tapi valley in Khandesh (IAR, 1956-57), sites in Vidarbha region (IAR, 1960-61), Koregaon (Sankalia, 1974) in Maharashtra; Arali and Fatorpa in Goa (IAR, 1964-65), sites in the Kurnool, Nalgonda (S.N. Rao, 1966), Chittoor and Renigunta (Murthy, 1966) districts in Andhra Pradesh; Post-Acheulian flakes from Attirampakkam (IAR, 1964-65) and Middle Palaeolithic from Gudiyam, (IAR

1962-63) in Tamilnadu; Kovallı, Anagawadı (Pappu, 1974), Tamnıhal (Sankalia, 1974) in Bijapur dıstrict; Bangaltota (Sankalıa, 1974) and Nıttur (Ansarı, 1970) ın Bellary dıstrıct, sıtes ın the Amarja valley (Nagaraju, 1971) ın Gulbaraga dıstrıct and sıtes ın the Manjra valley (Shadaksharaıh, 1984) in Bıdar dıstrict ın Karnataka.

Middle Palaeolıthıc tools are comparatıvely small ın sıze than the precedıng tool assemblage of Late Acheulıan phase. Tool types commonly met wıth ın the Mıddle Palaeolıthıc assemblage ınclude (a) scrapers (wıth varıous sub-types), (b) poınts, (c) borers wıth our wıthout tangs, (d) mınıature hand axes and cleavers and (e) occasıonally choppers. Tools are essentıally made on crypto-crystallıne sılıca comprısıng of agate, chalcedony, chert, jasper, etc., use of quartzıte is reported from sites ın Andhra Pradesh (Sankalıa, 1974). At Lachura, Mıdle Palaeolıthıc culture ıs represented by a pebble ındustry (Pant, 1982, et el pp 71). Some of the techniques commonly used are plaın flakıng or clactonıan (Pappu, 1974). Levallosıan technique has also been adopted ındıcatıng the contınuatıon of Late Acheulıan tradıtıons. Mousterıan character of tools have been reported from Andhra sıtes (Murthy, 1966). Generally assıgned to the second aggradatıonal perıod, thıs culture ın Maharashtra ıs dated between c. 17,000 - 39,000 BP on the basıs of c-14 datıng (Aggarwal and Kusumagar, 1974). The sequential posıtıon of thıs culture seems more or less clear ın almost all the reported sıtes. Besıdes, there are couple of sıtes where a transıtional stage from Lower to Mıddle Palaeolıthıc ıs also reported (Allchın, 1968).

In Karnataka, a great deal of work has been done by many scholars. However, these studıes are centered ın the North Karnataka regıon only. Bangaltota (Paddayya, 1970), Nıttur (Ansarı, 1970) ın Bellary dıstrıct, Anagawadi, Kovallı (Pappu, 1974) ın Bıjapur dıstrıct are some of the few ımportant sıtes where sequentıal posıtıon of thıs phase ıs well establıshed. Hagargudgı ın Gulbarga dıstrıct has yıelded fossıls of BOS and Elephas (Paddayya, 1971) along wıth tools. Besıdes numerous

sites in stratified context in these districts throw more light on various facets of this culture. Although studies of Kibbanahalli collection by Seshadri (1956) revealed the occurrence of Middle Palaeolithic assemblage, its stratigraphical position could not be ascertained.

My explorations in the Malnad region revealed a few sites in some of the river valleys. These include three in the Upper Tungabhadra, namely, Govinkovi, Chikbasur and Thakkanahalli; Hoisanahalli and Harakere in the Tunga valley; three sites in the Hemavati valley, namely, Kattebelguli, Kattehosalli and Cholenahalli; and Barandur in the Bhadra valley.

Stratigraphy: Most of these sites are located in the vicinity of the localities where Lower Palaeoliths occur, the stratigraphic sections of which are already described above. It is worth noting that the Middle Palaeolithic tools are found in the loose gravel in the Upper Tungabhadra, Tunga and Bhadra, but in the Hemavati, they are found embedded in the upper surface of the cemented bed in the sandy clay as well as gravel.

Environment: Most of the sites yielding Middle Palaeolithic tools are found in the vicinity of preceeding Lower Palaeolithic or succeeding Upper Palaeolithic or Mesolithic sites as the case may be, indicating preference of similar geographical settings by different cultural groups. The maidan area where majority of the sites are located receives 600 mm to about 650 mm rain annually and accommodates thorny shrubs to semi-deciduous forests in patches. The contemporary ecological and environmental conditions in the region under study may not have been different as is evident from the occurrence of Middle Palaeolithic tools in the same gravel bed where Lower Palaeoliths also occur. However, the sites at Thakkanahalli in the Upper Tungabhadra and in the sites in the Hemavati valley where tools are found embedded in the clay and sandy silt respectively resting over the gravel are

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some exceptions and may indicate a change in environmental conditions. Interestingly, Middle Palaeolithic sites are not found in the thick forest area. The concentration is essentially along the Maidan and semi-Malnad belt which probably indicates continuity in the reverine food habits and a change in hunting technology.

Rock material· Magnetite quartzite, white quartz, chloritic schist and chert are the chief rock materials found used. Use of quartzite for fashioning Middle Palaeolithic tools is already known (Sankalia, 1974). Tools are essentially made on flakes detached from small pebbles. The tool repertoire indicate use of big to medium size flakes, a feature common to the region under study. Cores have also been used but in small percentage. Rocks of crypto-crystelline silica is not readily available in the region. This seems to be the reason for using granular variety of rock material mostly. Artefacts made of chert and quartz are found centered in the Upper Tungabhadra and Tunga valleys while the artefacts retrieved from the Hemavati valley sites are essentially made on chlorite.

Kattebelguli in the Hemavati valley is the only factory site so far noticed in the region with large number of waste flakes, finished tools and cores. However, occurrence of tools in the large gravel beds is definitely an indication to postulate their local manufacture in other sites. Another potential site is Takkanahalli in the Upper Tungabhadra where comparatively large quantity of waste flakes and tools are found made on chert. Occurrence of prolific sites in the areas where close grained materials are available is noteworthy for, the tools found in the river bed are essentially made on coarse material.

MIDDLE PALAEOLITHIC SITES IN THE UPPER TUNGABHADRA

Middle Palaeolithic assemblage comprising points, scrapers, etc. picked up from the loose gravels near the present river bed of the Tungabhadra at various sites is as follows.

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Table No. 35

Typological distribution of Middle Palaeolithic tools in the Upper Tungabhadra valley sites

Tools	Sites				Percentage
	Chikbasur	Govinkovi	Thakkanahalli	Total	
Side scraper	1	4	25	30	34.89%
Double side scraper	2	-	2	4	4.66%
Round scraper	3	1	1	5	5.82%
End scraper	5	1	3	9	10.47%
Scraper cum borer	1	1	-	2	2.32%
Point	1	1	8	10	11.62%
Miniature hand axe	-	2	-	2	2.32%
Discs	2	2	4	8	9.30%
Unfinished cores	1	1	14	16	18.60%
Total ...	16	13	57	86	100%
Percentage ...	18.60%	15.12%	66.28%	100%	

Waste flakes of considerable number noticed at Thakkanahalli have not been included in the chart.

The main tool types available may be classified under the following categories.

(a) Scrapers (with various sub-types)
(b) Points
(c) Borers
(d) Discoids
(e) Miniature hand axes
(f) Unfinished cores

The last three categories are found mixed with typical Middle Palaeolithic in the loose pebbly gravel beds of the Upper Tungabhadra and the Tunga in the northern Malnad region. These tools can not be classified under the preceeding Lower Palaeolithic assemblage as they are distinctly different in size and shape. Probably these tools may

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indicate a gradual transition towards the true Middle Palaeolithic phase. In fact, the difference is hardly discernible. As already mentioned, transitional-stage-tools have been reported from various parts of the country (Sankalia, 1974). The tool repertoire of Thakkanahalli are fresh and few are in mint condition. Most of the tools are made on flakes representing characteristic features.

In the analysis of the 86 specimens, scrapers constitute the bulk with 55.84% and are mostly made on flakes. Amongst core tools, discoids form 9.30% of the total collection. Tools made on core constitute only 20% of the total collection while remaining 80% tools are made on flake.

As already mentioned, majority of the assemblage from Thakkanahalli are made on chert of different colours and few are made on quartz. Quartzite has also been used but sparsely. However, Middle Palaeoliths from the other two sites are exclusively of quartzite except one tool in chert picked from Chikbasur.

Though most of the specimens from Govinkovi and Chikbasur are rolled, worn out flake scars do show evidence of working. One of the end scrapers in mint condition exhibit employment of prepared core technique. Majority of the flakes are removed by using plain striking or Clacton technique. Discs are made on Levalloise cores. Secondary retouch is done in limited areas of the tool, none of the tool is fully retouched. These are heavy and may exhibit transitional phase features. Comparatively, the Thakkanahalli assemblage is a true representative of the Middle Palaeolithic phase in the Upper Tungabhadra. The tools characterised by typical features such as predominance of flake tools exhibiting controlled flaking, prepared platforms, retouching of the working ends, etc. In the collection, majority of the scrapers are found retouched on the dorsal side only. Bulb of percussion is prominent. These are fresh and few have working marks.

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Metrical analysis: Analysis of the tools from both the Govinkovi and Chikbasur assemblage on the one hand and the Thakkanahalli on the other have been discussed typewise seperately as they indicate two stages of development.

Table No. 36

Maximum measurements of the Middle Palaeolithic core tools from the Govinkovi and Chikbasur sites in the Upper Tungabhadra

Sl. No.	Length	Breadth	Thickness
1	70 mm	60 mm	50 mm
2	70 mm	60 mm	40 mm
3	75 mm	65 mm	40 mm
4	80 mm	65 mm	35 mm
5	90 mm	50 mm	50 mm
6	110 mm	80 mm	60 mm

The above table indicates slight variations among discs lengthwise but are uniform breadthwise. Sharp variation is seen in the thickness. By and large variation in the measurement seems to be proportionate between the two sites.

Like core tools, flake tools also show distinct variation in measurements as illustrated below.

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Table No. 37

Metrical analysis of the flake tools from Govinkovi and Chikbasur in the Upper Tungabhadra

Length	No. of tools	Breadth	No. of tools	Thickness	No. of tools
50 mm to 55 mm	5	30 mm to 35 mm	1	10 mm to 15 mm	7
55 mm to 60 mm	2	35 mm to 40 mm	4	15 mm to 20 mm	11
60 mm to 65 mm	4	40 mm to 45 mm	7	20 mm to 25 mm	1
		50 mm to 55 mm	3		
70 mm to 75 mm	4	55 mm to 60 mm	2	60 mm	1
75 mm to 80 mm	5	60 mm to 65 mm	1		
100 mm to 105 mm	1	65 mm to 70 mm	1		
	24		23		24

The above table shows considerable variations in the length, breadth and thickness of tools. Evidently, these tools do not exhibit any uniformity in their shape or thickness. Likewise, the maximum length available is 80 mm and the minimum is 50 mm. Of the 24 tools, 5 tools each ranging between 50-55 mm and 75-80 mm respectively constitute 56.6% of the total collection. Variation in breadth is noticeable. The maximum and minimum being 70 mm and 30 mm respectively. Breadthwise, tools ranging between 40-45 mm (29.1%) form the bulk of the collection. Thickness also varies considerably. The maximum being 60 mm. However, tools ranging between 15-20 mm constitute 41% of the total collection. The above analysis clearly indicate disproportionate size of the tools.

Among the 29 tools, unifacially worked tools constitute 26.89% (6 specimens) of the collection and the remaining 61.99% (23 specimens) are bifacially worked.

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As already mentioned, the tools collected from Thakkanahalli site are distinctly different in size and exhibit a developed stage. Analysis of only side scraper being the largest group, has been done for comparison and as a case study.

Table No. 38

Maximum measurement of side scrapers from Thakkanahalli, Upper Tungabhadra

Sl. No.	Length	Breadth	Thickness	Sl. No.	Length	Breadth	Thickness
1	55 mm	42 mm	11 mm	14	35 mm	28 mm	12 mm
2	53 mm	43 mm	12 mm	15	37 mm	27 mm	17 mm
3	50 mm	38 mm	11 mm	16	36 mm	24 mm	8 mm
4	50 mm	38 mm	6 mm	17	34 mm	30 mm	8 mm
5	48 mm	19 mm	12 mm	18	35 mm	29 mm	11 mm
6	41 mm	33 mm	15 mm	19	34 mm	25 mm	10 mm
7	45 mm	30 mm	14 mm	20	36 mm	24 mm	9 mm
8	46 mm	27 mm	13 mm	21	30 mm	22 mm	10 mm
9	41 mm	23 mm	11 mm	22	31 mm	25 mm	8 mm
10	36 mm	35 mm	12 mm	23	33 mm	25 mm	6 mm
11	41 mm	28 mm	9 mm	24	33 mm	28 mm	9 mm
12	46 mm	33 mm	16 mm	25	33 mm	28 mm	12 mm
13	42 mm	31 mm	15 mm				

The table indicates lengthwise scrapers falling between 30 mm to 37 mm account for 52%. The maximum and minimum being 55 mm and 30 mm respectively. Breadthwise, specimens ranging between 19 mm and 29 mm account for 60% of the collection. The maximum and minimum being 43 mm and 19 mm respectively. Thickness varies between 6 mm and 19 mm. 52% of these vary between 10 mm to 15 mm.

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As already mentioned, Middle Palaeolithic tools belonging to the sites in the upper streams and in the lower reaches of the Upper Tungabhadra vary considerably in terms of raw material, size and workmanship. Tools of the former group are heavy and exhibit rather crude finishing. Comparatively, tools of the latter group with typical tool types are small in size and are more refined due to controlled flaking. Predominance of quartzite and chert in the sites of upper and lower reaches respectively is noteworthy.

Description of tool types

(a) Side scrapers: In this category, one side of the tool is retouched to obtain working edge. In the collection, retouching is on the dorsal or ventral or on the both the surfaces. These tools are found in different shapes. Rectangular and triangular form dominate the collection. In some, cortex is retained.

(b) Double sided scrapers: Tools in this category have working edges on the lateral sides. Some times, the bottom end is also worked. Different forms are found in the category. Rectangular forms dominate.

(c) Round scrapers: Scrapers of this category are made on both the core and flake. The periphery is worked alround. Forms vary. These are worked on the dorsal or ventral sides or both. Retouching is done on both the surfaces. Alternate flaking and step flaking is also noteworthy.

(d) End scrapers: This category of scraper are worked at the top end or bottom end. Retouching is noticed along the margins on ventral or dorsal or both. Cortex is retained in some.

(e) Scraper-cum-point: It is made by flaking both the surfaces particularly near the working end. Deliberate notches near the working end is particularly noteworthy. Retouching of working point or tip is done.

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(f) Points: These are triangular in shape. Thin flakes are removed, vertically on either side or the tip is retouched, to obtain the point or the working end. Thick flakes are preferred.

(g) Discs: These are made on thick flakes or core of medium size, worked all over. Zigzag end attained by alternate flaking. Secondary working in few is noteworthy. Thick at the centre.

(h) Miniature hand axe: Made on flake, this typedoes not represent any features of the earlier culture except for the triangular form. Functional aspect can not be determined. Worked all over. There are two specimens of this category.

(i) Unfinished core: One of the margin exhibits alternate flaking. These seem to have been used as choppers. Two specimens are in the collection.

General observations: In the Upper Tungabhadra valley, there are only three sites of the Middle Palaeolithic phase. The distance between the three sites on an average measures 8 Kms. Tools are found in the loose gravel bed in the river in two locations while the third one is on the bank about 100 metres from the river bed. Two categories of tools are observed (a) tools made on core consisting of medium size discs and unfinished chopper like tools having twisted working edge obtained by alternate flaking; (b) second category is made on flakes comprising of various types of scrapers, points and borers. Scrapers dominate the assemblage. Tools are found in fresh as well as semi-rolled condition. However, rolling seems to be more due to movement of tools within the pebble bed rather than transportation. Rectangular and triangular shapes are predominant. Flakes are struck from medium size pebbles. In a few tools, pebble cortex is retained. Secondary retouch is done mostly on the dorsal side. 90% of the assemblage is flake tools evidently a flake industry. Govinkovi and Chikbasur tools are larger in size than the Thakkanahalli assemblage. Most of the flakes have

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been obtained by Clactonian technique. Employment of prepared core technique is evident in couple of tools. Discs and chopper like cores are dressed using alternate flaking method. Another important feature of the assemblage is sizewise tools from the sites in the upper reaches are nearer to the late phase of Acheulian rather than the typical Middle Palaeolithic phase. They are heavy and certain types such as discoids, cores which look like choppers with alternate working edge and miniature hand axe like tools tend to indicate a close affinity to the earlier phase. However, the employment of retouching of the margins, notches and the tool types suggest a noticeable change in technology, a characteristic of Middle Palaeolithic phase. In comparison, Thakkanahalli tool repertoire has all typical features of the true Middle Palaeolithic culture.

Another characteristic feature is the predominent use of quartzite in the sites of upper reaches indicating continuation of tradition from previous culture. Non-availability of crypto-crystalline silica in this area seems to be one of the reasons which forced the Middle Palaeolithic people to use quartzite available in plenty in the pebble beds. But this observation does not hold good for Thakkanahalli tools where chert of the crypto-crystalline family has been profusely used, a typical Middle Palaeolithic feature akin to sites in the North Karnataka. Granular varieties seem to have been opted in the Malnad region of southern Karnataka more due to local geological factors. Except Thakkanahalli, Middle Palaeolithic assemblage of Upper Tungabhadra are crude in workmanship when compared to the sites elsewhere in the North Karnataka region. They are usually heavy. Refinement and symmetry noticed in the Lower Palaeolithic is considerably absent. Stress is more on using flakes or cores in their primary form. Certain techniques used in earlier culture continue in this phase as can be seen from discoids and chopper like tools on core.

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Finally, Middle Palaeolithic phase of the Upper Tungabhadra can not be put in a definite chronological order from stratigraphic point. As already mentioned, evidence of only one aggradational phase is noticed in the Upper Tungabhadra. Elsewhere in the same valley at Nagasamudra, Hadonahalli, etc., Lower Palaeoliths have been picked up from the loose pebbly gravel bed. Similarly, Middle Palaeoliths also occur in the same gravel bed in Goinkovi and Chikbasur and at Thakkanahalli, they are found on the bank 100 m away from the river bed. A small Lower Palaeolithic hand axe retrieved from the Chikbasur site also indicates the presence of the Lower Palaeolithic culture. Such mixed industries have been reported in Peninsular India. For example, at Nittur in the Lower Tungabhadra valley, the feature has been noticed. However, it is only on the basis of typo-technology that the Middle Palaeolithic phase could be identified as succeeding the Lower Palaeolithic culture in the Upper Tungabhadra valley.

In comparison with the identity of the Middle Palaeolithic sites in the Krishna - Godavari valley, etc. and in relation to the Early Palaeolithic sites in the region under study, the Middle Palaeolithic sites are few and far between. This may be owing to two possibilities. Firstly, suitable rock materials for preparing effective tools were not available. Secondly, the tool equipment of the Middle Palaeolithic people would not have been quite suitable for wild evergreen forest areas.

MIDDLE PALAEOLITHIC SITES IN THE TUNGA VALLEY

In the Tunga valley, two sites have been located respectively at Hoisanahalli and Harakere. Stratigraphy and the environment in the area are similar to the Upper Tungabhadra already discussed. Tools made on both the core and the flake are available. These are big in size. Tool types comprise of chopper, point, scrapers with sub types, backed knife, etc. Artefacts were picked up from the loose pebbly gravel bed from both the sites. The table below indicates the typological distribution.

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Table No. 39

Typological distribution of the Middle Palaeoliths in the Tunga valley

Tool	Site		Total
	Hoisanahalli	Harakere	
Side scraper	5	2	7
End scraper	1	1	2
Round scraper	1	2	3
Scraper cum point	3	2	5
Point	2	-	2
Backed knife	1	-	1
Chopper	1	-	1
Total ...	14	7	21

As can be seen from the above table, as many as seven types of tools are available in the assemblage, the backed knife looking like a big lunate being a rare type. Round scrapers, slightly different from the typical Middle Palaeolithic round scrapers, are noteworthy. They are elongated and look more like miniature ovates. Even the scraper cum points are quite large in size.

As noted above, there are in all 21 specimens which can be divided into two groups. (a) Core tools (b) Flake tools.

Table No. 40

Distribution of the tools made on core and flake

Sl.No.	Type	Site		Percentage
		Hoisanahalli	Harakere	
1	Tools made on cre	2	3	23.81%
2	Tools made on flake	12	4	76.19%

Evidently, flake tools dominate the assemblage. Core tools are made on small to medium size river borne pebbles, available in plenty in the loose gravel bed. 80% of the core tools are represented by scrapers.

Table No. 41

Percentage of tool types

Sl. No.	Tool type	Total No.	Percentage
1	Side scraper	7	33.33%
2	Side scraper cum point	5	23.81%
3	End scraper	2	9.53%
4	Round scraper	3	14.28%
5	Point	2	9.53%
6	Backed knife	1	4.76%
7	Chopper	1	4.76%
	Total ...	21	100.00%

The Middle Palaeolithic tools of the tunga are most rolled. Working can be ascertained only from the depressions in the margins. Only two specimens are fresh. None of the tools in the assemblage is fully retouched. Marginal retouching is done both on the ventral and dorsal sides. The following table indicates the retouched margins of the specimens.

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Table No. 42

Description of retouching in the tools

Classification of retouched sides	Retouched surface				
	Dorsal	Ventral	Dorsal	Alternate	Others
1. Right side margin	9	-	-	-	-
2. Left side margin	2	-	-	-	-
3. Bottom	1	-	-	-	-
4. Alround	3	-	2	-	-
5. Tools devoid of retouching	-	-	-	-	4
Total ...	15	-	2	-	4

From the above table, it is evident that tools with retouching on the right side margin over the dorsal surface dominate the asemblage. This group accounts for 47.62% of the total collection followed by the specimens retouched alround on both the sides (23.8%). Similar feature is observed in the Upper Tungabhadra also. However, the above analysis indicates that no set pattern is adopted for retouching.

Metrical analysis: The entire assemblage is divided into two groups for analysing metrical characters of the tools, viz. (a) core tools and (b) flake tools.

Core tools: As already shown above, core tools consist of side scraper (1 No.), round scrapers (2 Nos.), scraper cum point (1 No.) and chopper (1 No.). Cores are of oval and triangular forms. All the specimens are made on medium to small size pebbles of brown and white quartzite. Flaking is usually shallow and steep. Round scrapers exhibit ridges all over due to step flaking. Core tools are thick at the centre.

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Table No. 43

Metrical analysis of core tools

Sl. No.	Maximum length	No. of specimen	Maximum breadth	No. of specimen	Maximum thickness	No. of specimen
1	50 mm	1	55 mm	2	40 mm to 45 mm	4
2	75 mm to 85 mm	3	60 mm	3	15 mm	1
3	90 mm	1	-	-	-	-

The above table indicates that lengthwise, the maximum and minimum measurement is 90 mm and 50 mm respectively. Tools ranging between 75-85 mm account for 60% of the total collection while the remaining specimens account for 20% each.

Breadthwise, all the tools range between 55 to 60 mm. 60% of them measure 60 mm and those measuring 55 mm account for 40% of the collection. Thicknesswise, 80% of the tools range between 40-45 mm while remaining one measures 15 mm (20%).

Ratio between length, bradth seems to be proportionate.

Flake tools: Flake tool group comprising side scrapers, round scrapers, end scrapers, points, etc. constitute 76.19% of the total assemblage. Tools are fashioned depending on the shape of the flake selected. Minute retouching to produce effective working end is observed in a few tools. Triangular and rectangular forms are predominant. The former accounts for 50% of the total collection while the latter accounts for 43.75%. 6.25% of them are round.

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Table No. 44

Metrical analysis of flake tools

Length	No. of specimens	Percentage	Breadth	No. of specimens	Percentage	Thickness	No. of specimens	Percentage
40 mm to 50 mm	2	12.5	30 mm to 40 mm	5	31.25	10 mm to 20 mm	7	43.25
50 mm to 60 mm	5	31.25	40 mm to 50 mm	7	43.75	20 mm to 30 mm	5	31.25
60 mm to 70 mm	2	12.5	50 mm to 60 mm	4	25.00	30 mm to 40 mm	4	25.00
70 mm to 80 mm	4	25.00						
80 mm to 100 mm	3	18.75						

The above analysis indicates greater variation in length. The maximum and minimum being 100 mm and 40 mm respectively. Tools ranging between 50-60 mm account for 31.25% of the flake assemblage. The next dominating group ranges betwen 70-80 mm accounting for 25%.

Breadthwise, only three groups are available, maximum being 60 mm. Tools ranging betwen 40-50 mm is followed by the group ranging between 30-40 mm accounting for 43.75% and 31.25% respectively.

There is no uniformity in the thickness. Tools ranging between 10-20 mm (43.75%) and those ranging between 20-30 mm (31.25%) dominate. It is evident that no standard range of measurements exists between the groups.

Tool types

Side scrapers· Side scrapers made on flakes dominate. Rectangular form is common. One side of the margin is used for working. Triangular, pointed or round tip is noteworthy. Retouching along the

working edge and tip. Steep flaking is noteworthy.

Round scraper: Both core and flake have been used. Two artefacts are oval in form recalling ovates of the Lower Palaeolithic. Alternate flaking and ridges on both the surfaces of artefacts is noteworthy.

End scraper: Thin shallow flake scars on the dorsal side of flakes. Working end is thin and retouched. Thick at the centre. Occurrence of identical specimen is noteworthy.

Points: Thin flakes are used for fashioning the points. Curved and round tip as well as prominent mid-rib are noteworthy.

Backed knife: This is a rare type in the entire assemblage. It is semi-circular. Resembles 'D' type scrapers. Working end is thin.

Chopper: It is made on a thick flake. Edge on the dorsal surface is worked. Prominent negative bulb of percussion. Not a common type.

General observations: Middle Palaeolithic sites of the Tunga valley are represented by many of the known tool types of this culture. However, occurrence of choppers, discoids and backed knife are some of the noteworthy tool types which do not necessarily form part of the regular tool kit of the Middle Palaeolithic culture, thereby indicating continuance of some of the late Acheulian tool types. Besides, the size of the tools and the techniques used for fashioning tools also support the above observations. Interestingly, similar feature has been noticed in the adjacent Upper Tungabhadra valley also. Further, occurrence of choppers and discoids have been reported from various other sites in the adjacent regions. Rock material used is essentially quartzite of brown or white colour. Absence of tools of crypto-crystelline silica indicates the preference of local material. Flake tools are predominant. Core tools are thick at the bottom. Ovate-like specimens with zigzag periphery is noteworthy. Bifacial working of specimen is akin to the feature noticed in the Upper Tungabhadra tool collection.

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MIDDLE PALAEOLITHIC SITES IN THE BHADRA VALLEY

Environmental conditions, ecology as well as stratigraphy are similar to the adjacent Tunga valley and does not seem to have differed much from the conditions prevailed during the preceeding Lower Palaeolithic period.

Two Middle Palaeolithic artefacts comprising a scraper and a discoid were collected from the loose gravel patch away from the Lower Palaeolithic site at Barandur which are distinctly different in size as well as technicque. Both are made on brownish quartzite. One is fresh while the second one is in semi-rolled condition. Both are fashioned on flakes evidently detached from river borne pebbles. Discoid exhibits prepared core technique. Scraper seems to have been detached from a core using stone hammer technique. Faceted platform, bulb of percussion are noteworthy. Retouching of the convex lateral margins on both the dorsal and ventral sides is noticed. Since the discoid is in semi-rolled condition, secondary retouching is not clearly visible. The small number of artefacts in the site is probably due to constant erosion of the pebble beds.

Side scrapers: This is a common type found in the Middle Palaeolithic assemblage. Working end is retouched.

Discoids: Essentially, one of the main types in the Lower Palaeolithic culture, it continues to occur in the tool repertoire of the Middle Palaeolithic in the Malnad region. It is noticed in the Upper Tungabhadra sites also. However, the sizes vary in length and thickness. Exact use is not known. The lone specimen is very small with an uneven surface and slightly zigzag periphery.

Observations: The specimens made on quartzite exhibit techniques noticed in the adjacent Tunga valley. Interestingly, tools occur in the gravel bed containing Lower Palaeolithic tools suggesting amenable ecological conditions even during the Middle Palaeolithic period.

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MIDDLE PALAEOLITHIC SITES IN THE HEMAVATI VALLEY

Comparatively speaking, the Middle Palaeolithic phase is distinctly reprsented in the Hemavati valley of the region under study. Investigations in the basin from its source till it crosses the district boundary of Hassan revealed three sites at Kattebelguli, Kattehosahalli and Cholenahalli. All these are situated in the lower course of the river. Kattebelguli is a factory site. Here, the artefacts were found in stratified context. In the other two sites, Mesolithic tools were also found but at a higher level on the present terrace of the river. Although explorations in the valley for 160 Kms revealed only three sites, it is not unlikely that further investigations may reveal some more sites.

Stratigraphy: At Kattebelguli, Middle Palaeolithic tools were picked up from the loose kankary gravel lying on the clay which covers the cemented gravel below. This stratigraphical position of the culture is similar to its occurrence elsewhere in Anagawadi, Kovalli in the Upper Krishna valley. The assemblage encountered here is the most prolific and include all the known types of tools of the Middle Palaeolithic tool kit.

Rock material· Three types of rock materials are used to fashion the tools. Close grained brown chlorite schist, magnetite quartzite and coarse quartz of white and brown colour. Schist is profusely used. After examining the samples, Dr. S.R.N. Murthy of the Geological Survey, Petrology division comments "The rock essentially contains mineral chlorite forming after Hornblende and some Biotite. In the specimens, there appears to be few pits filled with secondary materials probably calcium chlorite. These pits suggest that the rock could be originally a volcanic trap having metamorphosed now into chlorite schist". This rock material is available in the vicinity of the site while the other materials are available both in the form of pebbles and blocks. There is a lone artefact in the assemblage made of close

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grained bluish quartzite. Outer surface of the artefacts made on chlorite have reddish coat due to iron content in them. Although chlorite is close grained, it does not exhibit the same conchoidal fracture often observed in crypto-crystelline silica. This is one of the reasons why retouching is either totally absent in the Hemavati artefacts or sparsely found. However, it appears that due to non-availability of suitable rock materials, suspectible for conchoidal fracture, locally available rock materials have been used here, also a feature noticed elsewhere in the Malnad region.

Technique: Close examination of the flaking scars, bulb of percussion and faceted platforms in them indicate continuity of techniques already in vogue in the Lower Palaeolithic phase, such as stone hammer and cylindrical hammer techniques. However, step flaking scars even on small tools exhibit controlled flaking, a feature commonly noticed in the Middle Palaeolithic tools. Use of prepared core technique is also evident in a few specimens. By and large, tools represent broad shallow flake scars, stepped flaking and crude retouching probably due to the coarse nature of the rock material. Retouching is confined mainly on the upper surface and a few are retouched on both the sides. Some have striking platform and in some, they are plain or oblique. Multifaceted platforms are in two while single faceted specimens are 14 in number. Some have bulb of percussion on the ventral side.

Habitation sites: None of the three sites revealed any evidence relating to habitation. Although Kattebelguli is a prolific site, no traces of habitation in the form of human or animal fossils, remains of dwellings, could be traced. However, further investigations in the region may throw some light on this problem.

Artefact types: The Middle Palaeolithic assemblage of the Hemavati essentially belongs to flake group. However, there are two specimens

made on core also. Whether these represent a seperate tradition needs further investigation.

Table No. 45

Distribution of tools made on core and flake in the Hemavati valley

Sl. No.	Group	Total no. of tools	Percentage
1	Core	2	3.44
2	Flake	56	96.55
	Total	58	99.99

The tool assemblage comprises of scrapers with various sub types, points, scraper cum points, blades, discoids, awls and miniature ovate like tools. Chisel edged tool is a rare type in the assemblage. This type is already reported from the Upper Krishna basin. The tools are smaller in size than the Lower Palaeolithic tools. This group is entirely different from the Middle Palaeolithic assemblages found in the adjacent river valleys in the Malnad region, both in type and technique. The only similarity observed is in the case of mininature ovate-like artefacts, discoids and in the tools made on quartz. The difference seems mainly due to the rock material used.

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Table No. 46

Distribution of tools found in various sites in the Hemavati valley

Tool type	Name of the site			Total	Percentage
	Kattebelguli	Kattehosahalli	Cholenahalli		
Scraper group					
Side scraper	8	-	-	8	13.8
End scraper	3	-	-	3	5.18
Round scraper	5	-	-	5	8.62
Scraper-cum-point	5	-	-	5	8.62
Point group					
Triangular point	6	4	3	13	22.40
Bladish point	2	-	-	2	3.45
Double point	1	-	-	1	1.72
Beaked point	1	-	-	1	1.72
Shouldered point	1	-	1	2	3.45
Others					
Blade	7	1	1	9	15.51
Discoid	3	-	-	3	5.16
Chisel edged tool	2	-	-	2	3.45
Awl	1	-	1	2	3.45
Ovate	-	2	-	2	3.45
Total ...	45	7	6	58	100.00

The above main tool types and the sub-types noticed within scraper and point groups are described below along with metrical analysis. Besides, other tool types are also described.

Scrapers: Scraper is one of the most important types of the Middle Palaeolithic tool assemblage. The collection comprises of 21 specimens (36.27%) forming the largest group. These tools seem to have been used for scraping the flesh from the skin as well as for piercing. Normally, artefacts of this group have retouched edges on one or both the sides. Some times, scraping edge is hallowed or worked along the end or alround. On the basis of secondary flaking along the edges and shapes, various sub-types of scrapers have been identified. They are as follows:

Sl.No.	Types	Percentage	
		of the total collection	of the scraper collection
1	Side scraper	13.79%	38.95%
2	Round scraper	8.62%	23.89%
3	End scraper	5.17%	13.12%
4	Scraper cum point	8.62%	23.89%

In the scraper group, side scrapers constitute the largest group (38.95%). These tools are fashioned on medium to small size flakes detached from cores. Few are made on Levalloisian flake. Shallow flake scars on the upper surface vary between 3-6 in number. Under surface is retouched in two specimens. Wavy edge in one tool seems to be due to alternate flaking. Working edge on the upper surface retouched in a few specimens. Some specimens exhibit use marks along the edge and are thick at the centre obviously due to prominent mid ridge. The collection includes 3 sub-triangular, 3 triangular and three rectangular shaped scrapers.

Analysis: The maximum and minimum length is 79 mm and 40 mm respectively. The maximum and minimum breadth is 59 mm and 39 mm respectively. In thickness also, variation is observed. The maximum and minimum is 32 mm and 16 mm respectively.

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Round scraper: Round scrapers account for 23.89% of the total collection of scraper. One artefact is made on Levalloisian flake. In this group, small flake scars are visible on the periphery alround. The edge is wavy due to alternate flaking. Few artefacts exhibit bifacial working and faceted platforms. Mid ridge is prominent, zigzag and thick at the centre. Two artefacts are in mint condition while the remaining three are slightly rolled. Thin coat of patination in a few is noteworthy.

Analysis

Sl. No.	Length	Breadth	Thickness
1	85 mm	55 mm	30 mm
2	75 mm	65 mm	18 mm
3	84 mm	62 mm	55 mm
4	60 mm	62 mm	25 mm
5	70 mm	60 mm	31 mm

The above table indicates that variations between each group is limited. The maximum length, breadth and thickness being 88 mm, 65 mm and 55 mm indicate the size and shape of the specimens. However, the average length, breadth and thickness of specimens is 75.40 mm, 61.40 mm and 31.80 mm rspectively.

End scraper: The specimens belonging to this category are only three in number and these form 13.12% of the total collection of scrapers. Two specimens are made on chlorite while the third one is made on a quartz flake detached from a pebble as is evident from a patch of cortex on the dorsal side of the specimen. Primary flake scars are seen on the dorsal side only. Ventral side is plain in all the specimens. Bulb of percussion and retouching of the scraping edge are some of the noteworthy features.

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Analysis

Sl. No.	Length	Breadth	Thickness
1	74 mm	60 mm	20 mm
2	68 mm	41 mm	12 mm
3	45 mm	43 mm	16 mm

The maximum length, breadth and thickness in this group is 74 mm, 60 mm and 20 mm. The average being 62.3 mm, 48 mm and 16 mm respectively.

Scraper-cum-point: These are made on thick flakes. This group accounts for 23.89% of the total collection of scrapers; shallow flake scars vary between 4-8 on one side of the surface. One artefact represents step flaking on both the sides. Few exhibit limited retouching on the margin over the dorsal surface. Periphery is wavy obtained by alternate flaking. The thin roundish point is attained by removing a thin flake by a deep notch or by removing a thin flake from the under surface. In some, the original thin end of the flake is used as point and slight retouching is done near the margins on the under surface. Prominent bulb of percussion and mid ridge are other features. All are triangular in shape.

Analysis

Sl. No.	Length	Breadth	Thickness
1	78 mm	56 mm	15 mm
2	60 mm	46 mm	15 mm
3	79 mm	61 mm	26 mm
4	75 mm	57 mm	30 mm
5	51 mm	50 mm	26 mm

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Lengthwise, most of these specimens fall between 70-30 mm with an average of 67.2 mm. Breadthwise, specimens ranging between 50-60 mm dominate with an average of 54 mm. Variation in the thickness is more. The maximum and minimum is 30 mm and 15 mm with an average of 22 mm. It is evident that there is no proportionate ratio between metrical characters.

Point : There are in all 19 points of varying shapes made on medium to small size flake of chlorite schist and quartz accounting for 32.75% of the total collection. These are simple tools with one or more pointed tips used essentially for piercing. The working tip is attained by producing a deep notch on one side of the specimen at the top or by removing small flakes near the top to attain the desired result. In some specimens, curved or beak like projections are also made. Such types occur in the preceeding culture also. Majority of the specimens are worked on dorsal side while the ventral side is plain. Bulb of percussion is common in these specimens. Bifacially worked specimens are only two in the entire collection. Shallow flake scars vary from 3-6 on one surface. Prominent mid rib, step flaking and incipient tang are some of the important features. Specimens with double point and beaked point are noteworthy. Shouldered points are rare. Such varied types are noticed in the Malnad region for the first time. Two groups are distinct, viz. (a) those made on thick and broad flakes, and (b) those made on thin and small flake. However, these are treated as one group since the functional aspect is one and the same. Two forms are noticeable, viz. triangular (84.21%) and irregular form (15.79%).

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Table No. 47

Type-wise distribution of points

Sl.No.	Tool type	No. of specimens	Percentage
1	Ordinary point	13	68.42%
2	Shouldered point	2	10.52%
3	Double point	1	5.27%
4	Beak shaped point	1	5.27%
5	Bladish point	2	10.52%

Above chart indicates the dominance of ordinary or simple points.

Metrical analysis

Sl. No.	Maximum length	No. of specimens
1	30 mm to 40 mm	5
2	40 mm to 50 mm	2
3	50 mm to 60 mm	4
4	60 mm to 70 mm	2
5	70 mm to 80 mm	2
6	80 mm to 90 mm	4

The longest specimen in the collection measures 90 mm while the shortest 30 mm. The most frequent length is between 30 mm to 40 mm with 26.30% followed by specimens ranging between 50 mm to 60 mm and 80 mm to 90 mm with 31.52% each. Other groups with 2 specimens account for 10.52% each.

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Analysis

Sl. No.	Maximum breadth	No. of specimens
1	15 mm to 25 mm	3
2	25 mm to 35 mm	3
3	35 mm to 45 mm	7
4	45 mm to 55 mm	1
5	55 mm to 65 mm	3
6	65 mm to 75 mm	1
7	75 mm to 85 mm	1

Similarly, the broadest of the specimens measures 85 mm and the narrowest measures 15 mm. Specimens ranging between 35 mm to 45 mm are the most frequent with 36.84% followed by groups ranging between 15-25 mm, 25-35 mm and 55-65 mm with 15.78% each. The remaining groups ranging between 45-55 mm, 65-75 mm and 75 mm to 85 mm account for 5.27% each.

Analysis

Sl.No.	Maximum thickness	No. of specimens
1	1 mm to 10 mm	5
2	10 mm to 20 mm	4
3	20 mm to 30 mm	9
4	30 mm to 56 mm	1

Thickness of points vary between 56 mm to 1mm. The most frequent is the ones ranging between 20 mm to 30 mm with 47.37% followed by specimens ranging between 1-10 mm with 26.30%. The remaining categories ranging between 10-20 mm and 30-56 mm account for 21.52% and 5.26% respectively.

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Awls: Only two specimens are found. These account for 3.44% of the total collection of tools. Made on one side flakes, both the specimens exhibit numerous step flake scars on the dorsal side. Bulb of percussion on the ventral side and unretouched platform are other features. A small sharp point is achieved at the middle of the loger axis of the flakes. Both are fresh. The maximum length, breadth and thickness measure 50 mm, 45 mm and 9 mm respectively.

Chisel edged tools: These are made on small elongated flakes and account for 3.44% of the total collection of tools. Both the specimens are fresh and exhibit features of burin. Small vertical flake is removed at the top on the left lateral side while the right lateral side or thumb hold edge is blunted by secondary retouching to achieve curved back. Cutting edge on the left lateral side is devoid of retouching. The second specimen exhibits removal of small flake obliquely to achieve a projected sharp point which is also retouched. Two long shallow flakes have been removed on the dorsal side resulting in a prominent straight mid ridge. Both are rare tools found in the Malnad region. The maximum length, breadth and thickness measure 45 mm, 24 mm and 12 mm respectively.

Discoids: These are made on thick chlorite flakes and account for 5.17% of the total collection of tools. These are almost circular in shape; zigzag periphery is obtained by alternate flaking. All the three specimens are worked bifacially and thick at the centre. Flake scars vary between 6 - 10 on one side and converge at the centre indicating Levalloisian technique. The maximum length, breadth and thickness measure 74 mm, 67 mm and 34 mm respectively and the average length, breadth and thickness measure 64.64 mm, 56.35 mm and 39 mm respectively.

Ovates: These are small ovate shaped tools worked on both the surfaces. These account for 3.44% of the total collection. Made on medium size quartz pebbles, these have zigzag mid-ridge, hence thick at

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the centre. Shallow flake scars varying between 5-6 on one surface. Wavy periphery is indicative of alternate flaking. The exact use of this tool is not known. This is not a typical Middle Palaeolithic tool type. However, its occurrence indicates continuation of earlier tradition. The maximum length, breadth and thickness measure 88 mm, 64 mm and 58 mm respectively.

Blades: This is by far, the most distinct type in the assemblage. There are 9 specimens in the collection of this type accounting for 15.51%. These are made on both elongated as well as small flakes. The cutting edge is obtained by removing a flake at oblique angle and the opposite thick side is used to hold. Edge is sharp and devoid of retouching. Lateral sides are curved. Two specimens have tangs suggesting hafting. Leaf shaped specimen is a rare type. Mid ridge is almost straight, obviously tools are thick at the centre. 2-3 flake scars are visible on one surface. One specimen is bifacially worked and the remaining specimens are unifacially worked. Bulb of percussion and highly controlled flaking are other features.

Analysis

Sl.No.	Length	No. of specimens
1	25 mm to 35 mm	4
2	35 mm to 45 mm	2
3	45 mm to 90 mm	3

The maximum and minimum length of the specimens are 90 mm and 29 mm respectively. Specimens ranging between 25 mm and 35 mm are the most frequent with 44.44% followed by the tools ranging between 60-90 mm with 33.33%. Those ranging between 35-45 mm in the collection account for 22.22%.

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Analysis

Sl. No.	Breadth	No. of specimens
1	20 mm to 30 mm	4
2	30 mm to 40 mm	3
3	40 mm to 50 mm	2

The maximum and minimum breadth of the specimens measure 47 mm and 20 mm respectively. Tools ranging between 25-35 mm dominate with 44.44% followed by tools ranging between 30-40 mm with 33.33% and those ranging between 40-50 mm account for 22.22%.

General observations: The Middle Palaeolithic sites are found located in the Lower Hemavati valley near the river bed. Tools occuring in stratified context in this valley is particularly noteworthy when compared to other river valleys in the region under study where tools do not occur in stratified context. Chlorite schist and quartz have been preferred in the absence of close grained rock materials. Use of stone hammer and prepared core techniques is a noteworthy feature. Most of the artefacts are in 'Mint' condition. A few of them also have a thin coat of patination. Tool repertoire is rich and a few types such as chisel edged tools, ovates are typical of this industry in the region. Interestingly, similar types have been reported from sites in the Upper Krishna basin and Upper Tungabhadra valley respectively.

The assemblage is similar to the assemblage noticed in the adjacent valleys in the region under study. Although typical tool types of the Middle Palaeolithic culture occur, the size and technology are more akin to the preceeding Late Acheulian phase. Further, the occurrence of bladish flakes along with scraper point assemblage also is enigmatic for, whether this is a development from the Middle Palaeolithic is not clear for, no Upper Palaeolithic site has been found in this valley. Further intensive work may throw more light on these problems in the region.

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MIDDLE PALAEOLITHIC TOOL TYPES

Figure I : Hand axe (Miniature), ovate and chopper

(1)

River valley : Upper Tungabhadra Site· Govinakovi

Rock material: Quartzite Tool type: Miniature hand axe

Description: Roughly triangular in shape. Shallow elongated flake scars on the dorsal surface. A shallow flake scar visible at the centre of ventral surface. Zigzag mid rib. Deep notch in the middle on the right lateral side. Partially cortexed thick butt. Rounded tip. Slightly rolled. Measures 9.5 cm x 5.3 cm x 4 cm.

Rare type.

(2)

River valley : Upper Tungabhdra Site· Chikbasur

Rock material: Quartzite Tool type: Miniature hand axe

Description: Made on a thin flake, triangular shaped. Steep flaking on the dorsal side; prominent mid rib. Shallow flake scars visible on the ventral side and faint positive bulb of percussion. Curved tip. Semi rolled. Measures 8 cm x 6.5 cm x 2.5 cm.

Rare type.

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(3)

River valley : Tunga Site: Hoisanahalli
Rock material: Quartz Tool type: Chopper

Description: Made on a brownish pebble of medium size. Shallow flake scars along the convex working side. Cortexed butt end and ventral surface. Semi rolled. Measures 9 cm x 6 cm x 4 cm.

Rare type.

(4)

River valley : Hemavati Site: Kattebalguli
Rock material: Quartz Tool type: Ovate (miniature)

Description· Made on a pebble of medium size. Shallow flake scars on both dorsal and ventral sides. Zigzag periphery. Mid ridge is wavy on both the sides. Thick at the centre. Bi-convex cross section. Semi rolled. Measures 8.8 cm x 5.5 cm x 5.8 cm.

Comparable to: No. 7, Pl. VIII, Karadigudda (Seshadri, 1956).

(5)

River valley · Tunga Site: Hoisanahalli
Rock material: Quartz Tool type· Ovate (miniature)

Description: Made on a medium sized pebble. Shallow step flaking on the dorsal surface. Ventral surface uneven due to shallow flaking. Thick at the centre. Zigzag periphery. Semi rolled. Measures 8.5 cm x 5.6 cm x 4 cm.

Comparable to· Variation of No. 4.

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Figure II : Discoids

(6)

River valley : Upper Tungabhadra Site: Govinkovi
Rock material: Quartzite Tool type: Discoid

Description: Made on a small pebble core. Shallow flake scars converging at the middle on the dorsal side. Ventral side is also flaked. Zigzag working edge on all the sides. Rolled and thick at the centre. Measures 7 cm x 6 cm x 5 cm.

Comparable to: No. 3, Pl. VII, Kibbanahalli (Seshadri, 1956).

(7)

River valley : Bhadra Site· Barandur
Rock material: Quartz Tool type· Discoid

Description: Made on a small whitish flake. Prominent ridge on the dorsal side. Step flaking on both the sides. Working edge is slightly zigzag. Thick at the centre. Semi rolled. Measures 6 cm x 5 cm x 3.5 cm.

Comparable to· No. 1, Pl. NO. 11, Nidaghatta (Seshadri, 1956).

(8)

River valley : Upper Tungabhdra Site: Thakkanahalli
Rock material: Milky quartz Tool type· Discoid

Description: Round shaped, made on a thick flake. Numerous shallow flake scars on both the dorsal and ventral surfaces. Prepared core flaking distinctly visible on the dorsal side. Thin zigzag periphery; thick at the centre, fresh. Measures 4.7 cm x 4.4 cm x 2.1 cm.

Comparable to· Variation of No. 6.

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(9)

River valley : Hemavatı Site· Kattebalgulı
Rock material: Chlorite schist Tool type: Discoid

Description: Made on a thick flake, roughly circular in shape. Shallow flake scars converging at the middle on both the dorsal and ventral sides. Zigzag periphery. Thick at the centre. Yellowish patination. Biconvex cross section. Semi rolled. Measures 6 cm x 5.3 cm x 3.4 cm.

Comparable to: Variation of No. 6.

(10)

River valley : Hemavatı Site: Kattebelgulı
Rock material· Chlorite schist Tool type· Discoid

Description: Made on thick flake, roughly circular in shape. Shallow step flake scars on both dorsal and ventral sides, wavy periphery; thick at the centre; patinated; semi rolled. Measures 7.4 cm x 6.7 cm x 3.2 cm.

Comparable to: Variation of No. 9.

Figure III : Side scrapers

(11)

River valley : Upper Tungabhadra Site· Thakkanahalli
Rock material: Chert Tool type· Side scraper

Description· Rectangular shaped, made on a thick flake. Shallow flake scars converging at the middle on the dorsal side indicate prepared core technique. Shallow flake scars on the ventral side. Thick at the centre due to prominent mid rib. Zigzag periphery. Slightly rolled. Measures 5.7 cm x 4.2 cm x 2.1 cm.

Comparable to: No. 15, Fig. 22, Kovalli (Pappu, 1974).

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(12)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Side scraper

Description: Roughly square shaped; made on a thick flake of medium size. Shallow step flake scars from all the sides, converge at the centre on the dorsal side indicating prepared core technique. Plain ventral surface. Portion of left lateral margin as well as far end retouched on the dorsal side. Thick at the centre. Fresh. Measures 3.9 cm x 3.9 cm x 1.6 cm.

Rare type.

(13)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Side scraper

Description: Rectangular shaped; made on a thick flake of medium size. Shallow flake scars converging at the middle on the dorsal side. Plain ventral surface. Convex left margin retouched on the dorsal side. Roughly, straight right margin. Fresh. Measures 4.1 cm x 2.6 cm x 1.2 cm.

Comparable to: NO. 5, Fig. 37, Nagarjunakonda (Subramanyam, 1975).

(14)

River valley : Bhadra Site: Barandur
Rock material: Quartzite Tool type: Side scraper

Description: Rectangular shaped; made on a thick flake. Much of the cortex retained on dorsal side and the right lateral side. Left side margin worked on the dorsal side. Positive bulb of percussion and the striking platform on the ventral side. Fresh. Measures 7 cm x 5.5 cm x 2 cm.

Comparable to: No. 18, Fig. 37, Nagarjunakonda (Subramanyam, 1975)

(15)

River valley · Tunga — Site· Hoisanahalli
Rock material: Quartz — Tool type· Scraper

Description: Triangular shaped, made on a thick flake. Dorsal surface, has single shallow flake scar. Ridges are prominent. Retouched right side margin on the dorsal side. Plain ventral surface and bulbous scar. Striking platform. Measures 6.5 cm x 4.5 cm x 1.6 cm.

Comparable to: No. 19, Fig. 37, Nagarjunakonda (Subramanyam, 1975).

(16)

River valley : Upper Tungabhadra — Site· Govinkovi
Rock material: Quartz — Tool type· Side scraper

Description: Rectangular shaped, made on a thick flake, white in colour. Shallow flaking of the dorsal side. Plain ventral surface. Retouched right lateral margin. Tip is little pointed. Plain striking platform. Rolled. Measures 5.5 cm x 4 cm x 2 cm.

Rare type.

(17)

River valley · Hemavati — Site· Kattebelguli
Rock material: Chlorite schist — Tool type Side scraper

Description: Triangular shaped, made on a thick flake. Shallow flake scars on both the surface. Chipping near the top of left lateral side. Thin patch of brownish patina. Thick at the centre. Semi rolled. Measures 6 cm x 4.6 cm x 2.2 cm.

Comparable to: Roughly to No. 3, Fig. 37, Nagarjunakonda (Subramanyam, 1975).

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(18)

River valley · Hemavatı Site Kattebelgulı
Rock material: Chlorıte schist Tool type. Sıde scraper

Descrıptıon: Made on a thın flake; roughly sub-trıangular ın shape. Shallow flake scars and patch of cortex on the dorsal sıde. Plain ventral sıde. Retouched rıght margin on the dorsal sıde. Faceted platform. Slightly rolled. Measures 6.3 cm x 5.9 cm x 1.6 cm.

Comparable to: No. 10, Pl. 6, Malaprabha (Joshı, 1980).

(19)

River valley : Hemavatı Sıte· Kattebelgulı
Rock materıal: Chlorıte schıst Tool type: Sıde scraper
Description: Made on a thıck Levalloısıan flake. Roughly rectangular in shape. Shallow flake scars visıble on both the dorsal and ventral sıdes. Faınt chıppıng on the left sıde margın. Patınated surface. Semı rolled. Measures 7.9 cm x 5.9 cm x 1.8 cm.

Comparable to· No. 3, Pl. 4 (Paddayya, 1980).

Fıgure IV : Round end and Double sıded scrapers

(20)

River valley : Upper Tungabhadra Sıte: Chıkbasur
Rock material: Mılky quartz Tool type: Round scraper

Descrıptıon: Made on a thın whıtısh flake. Shallow step flake scars on the dorsal and ventral sıdes. Retouched workıng margın alround. Prepared platform. Thıck at the centre. Fresh. Measures 6 cm x 5 cm x 1.5 cm

Comparable to: No. 17, Fıg. 22, Upper Krıshna (Pappu, 1974).

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(21)

River valley : Upper Tungabhdra Site· Govınkovı
Rock material: Quartzıte Tool type· Round scraper

Descriptıon: Made on a thıck small pebble. Shallow step flake scars and patch of cortex on dorsal surface. Plaın ventral sıde. Workıng edge retouched alround. Measures 5 cm x 5 cm x 3 cm.

Rare type.

(22)

River valley · Hemavatı Sıte: Kattebelgulı
Rock material: Chlorite schıst Tool type· Round scraper

Description: Made on a thın brownısh flake. Shallow flake scars on the dorsal sıde. Plain ventral sıde, worked perıphery. Faceted platform. Fresh. Measures 7.5 cm x 6.5 cm x 1.8 cm.

Comparable to: No. 18, Fıg. 22, Upper Krıshna (Pappu, 1974).

(23)

Rıver valley : Upper Tungabhadra Sıte: Chıkbasur
Rock materıal· Quartzıte Tool type: End scraper

Descriptıon: Trıangular shaped, made on a thıck flake of brown colour. Shallow flake scars and cortex patch on dorsal sıde. Ventral sıde also exhıbıts elongated shallow flake scars and prominent rıbs. Retouched bottom edge and portion of sıde margıns. Measures 7 cm x 5 cm x 3 cm.

Comparable to: No. 16, Fıg. 22, Kovallı (Pappu, 1974).

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(24)

River valley : Tunga — Site: Hoisanahalli

Rock material: Quartz — Tool type: End scraper

Description: Roughly oval shaped; made on a thick flake of brown colour. Small shallow flake scars on the dorsal side. Steep flaking of the ventral side to obtain thin working edge. Retouched working edge. Thick at the centre. Rolled. Measures 5.5 cm x 3 cm x 2 cm.

Rare type.

(25)

River valley : Hemavati — Site: Kattebelguli

Rock material: Chlorite schist — Tool type: End scraper

Description: Made on a thick flake of brownish colour. Roughly triangular. Shallow flake scars on the dorsal side. Prominent bulb of percussion on the ventral side and ridge near the periphery. Slight chipping on the left lateral side. Fresh. Measures 7.4 cm x 6 cm x 2 cm.

Rare type.

(26)

River valley : Upper Tungabhadra — Site: Thakkanahalli

Rock material: Chert — Tool type: End scraper

Description: Made on a thick flake, roughly oval shaped. Shallow flake scars on the dorsal side. Protruded plain ventral surface. Minute flake scars along the distal end on the ventral side. Thin working end. Fresh. Measures 4.4 cm x 3.5 cm x 1.7 cm.

Comparable to: No. 3, Fig. 47, Kurnool (Sankalia, 1975).

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(27)

River valley : Upper Tungabhadra Site: Chikbasur
Rock material: Quartz Tool type: Double sided scraper

Description: Rectangular shaped; made on a thin brownish blade. Much of the cortex retained on the dorsal side. Ventral side including portion of bulb of percussion fully flaked. All the three sides continuously retouched - mainly on the ventral side and partially on the dorsal side. Semi-rolled. Measures 5 cm x 4.5 cm x 1.5 cm.
Comparable to: No. 21, Fig. 21, Kovalli (Pappu, 1974).

(28)

River valley : Upper Tungabhadra Site: Chikbasur
Rock material: Quartzite Tool type Double sided scraper

Description: Made on a small thin flake, grey in colour. Sub-triangular shaped. Shallow flake scars and depression on the dorsal side. Bulb of percussion on the ventral side. Both the margins retouched on the ventral side. Prominent ridge along the right margin. Plain platform. Fresh. Measures 4.9 cm x 2.8 cm x 1.1 cm.

Comparable to: No. 5, Fig. 37, Nagarjunakonda (Subramanyam, 1975).

Figure V : Scraper cum point

(29)

River valley : Upper Tungabhadra Site: Chikbasur
Rock material: Quartz Tool type: Side scraper cum point

Description: Triangular shaped; made on a brown thin flake. Shallow flake scars on both the dorsal and ventral surfaces. Working edge retouched on the ventral side. Point obtained by a notch on the left lateral margin near the tip. Fresh. Measures 5 cm x 4.5 cm x 1.5 cm.

Comparable to: No. 15, Fig. 37, Nagarjunakonda (Subramanyam, 1975).

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(30)

River valley : Upper Tungabhadra Site: Hoisanahalli
Rock material: Quartz Tool type: Scraper cum point

Description: Triangular shaped; made on a thick whitish flake. Dorsal side steeply flaked. Prominent mid rib. Ventral side has uneven surface due to shallow flake scars. Right side margin retouched from both the sides. Sharp retouched point. Semi-rolled. Measures 7 cm x 6 cm x 2.5 cm.

Rare type.

(31)

River valley : Tunga Site: Harakere
Rock material: Quartz Tool type: Scraper cum point

Description: Triangular shaped; made on a thick brownish flake. Steep flaking on all the sides on the dorsal surface resulting in a prominent mid rib. Ventral surface has shallow flake scars. Retouched periphery on all the three sides. Point obtained by producing two notches near the upper end. Thick at the centre. Semi rolled. Measures 9 cm x 6 cm x 4 cm.

Rare type.

Figure VI : Point group

(32)

River valley : Upper Tungabhadra Site: Chikbasur
Rock material: Quartz Tool type: Point

Description: Triangular shaped; made on a small thick whitish pebble. Shallow flake scars and patch of cortex on the dorsal surface. Cortexed ventral side and small flake scar. Prominent ridge on the dorsal side. Semi rolled. Measures 6.5 cm x 4.5 cm x 2 cm.

Comparable to: No. 25, Fig. 37, Nagarjunakonda (Subramanyam, 1975).

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(33)

River valley : Upper Tungabhadra Site: Govinkovi
Rock material: Quartz Tool type: Point

Description: Triangular shaped; made on a thick whitish flake. It looks like a miniature hand axe. Dorsal and ventral sides, have shallow flake scars. Zigzag margin. Beak shaped tip obtained by a notch along the right margin near the far end. Slightly rolled. Thick round bottom. Measures 8 cm x 4 cm x 2 cm.

Rare type.

(34)

River valley : Upper Tungabhadra Site. Thakkanahalli
Rock material: Quartz Tool type: Point

Description: Roughly rectangular shaped; made on a thick flake. Shallow flake scars on both the surfaces. Prominent mid rib on the dorsal side. Symmetric margins. Slightly curved working point attained by producing a notch at the top on the left lateral margin. Secondary retouch of margins near the point. Pointed bottom obliquely flaked. Thick at the centre. Fresh. Measures 5.8 cm x 3.3 cm x 2.1 cm.

Comparable to: No. 1, Fig. 45, Tammihal (Sankalia, 1975).

(35)

River valley : Upper Tungabhadra Site· Thakkanahalli
Rock material: Quartzite Tool type Point

Description: Roughly triangular in shape, made on a thick brownish flake. Shallow flake scars and slightly retouched convex margin on the dorsal side. Plain ventral surface. Vertically dressed left margin. Broken tip probably beak like as is evident from the curved top. Fresh. Measures 5.4 cm x 4.5 cm x 1.5 cm.

Comparable to: No. 30, Fig. 37, Nagarjunakonda (Subramanyam, 1975).

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(36)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type: Point

Description: Triangular shaped, made on a thin flake of medium size. Shallow flake scars and step due to cleavage of rock on the dorsal side. Portion of bulb of percussion on the depressed, ventral side. Prepared platform on the right margin. Dorsal side of left margin retouched near the top. Point attained by oblique flaking of the margin at the top. Fresh. Measures 4.8 cm x 4.5 cm x 1.2 cm.
Comparable to: No. 25, Fig. 22, Upper Krishna (Pappu, 1974)

(37)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type: Point

Description: Made on a thick irregular flake. Shallow flake scars prominent mid rib on the dorsal side. Diffused bulb of percussion and few shallow flake scars near the bottom on the ventral side. Platform on the right margin and flutings on the left margin. Round point and secondary retouch of the margins on either side of the point. Fresh. Measures 4.9 cm x 3.4 cm x 1.3 cm.

Comparable to: No. 26, Fig. 22, Kovalli (Pappu, 1974).

(38)

River valley : Tunga Site: Hoisanahalli

Rock material: Quartz Tool type: Point

Description: Triangular shaped, made on a thin whitish flake. Shallow flake scars on the ventral and dorsal surface. A deep notch near the tip on the left side margin. Slightly curved point. Rolled. Measures 6 cm x 3.5 cm x 1.5 cm.

Rare type.

(39)

River valley : Hemavatı — Sıte: Kattebelgulı
Rock material: Quartz — Tool type: Poınt

Description: Made on a thick flake; trıangular shaped; shallow flake scars and promınent mıd rıdge on the dorsal sıde. Plaın ventral sıde. Fresh. Triangular cross sectıon. Measures 5.7 cm x 3.7 cm x 2.4 cm.

Comparable to: No. 25, Fıg. 37, Nagarjunakonda (Subramanyam, 1975).

(40)

River valley : Hemavati — Sıte: Kattebelgulı
Rock materıal: Trap — Tool type· Poınt

Descrıptıon: Made on a thıck bluısh flake. Trıangular ın shape. Numerous shallow flake scars on both the dorsal and ventral sıdes. Curved mıd rıdge on the dorsal sıde. Curved tıp. Trıangular cross sectıon. Slıghtly rolled. Measures 7 cm x 3.7 cm x 2 cm.

Comparable to: No. 31, Fıg. 37, Nagarjunakonda (Subramanyam, 1975).

(41)

Rıver valley : Hemavatı — Sıte· Cholenahallı
Rock materıal: Chlorıte — Tool type: Poınt

Description· Made on a thın flake, triangular ın shape. Shallow flake scars and retouched margın on the dorsal sıde. Wavy mıd rıdge. Bulb of percussion on the ventral sıde. Faceted platform. Poınted tıp. Slightly rolled; bi-convex cross sectıon. Measures 3.5 cm x 2.6 cm x 0.4 cm.

Comparable to: NO. 29, Fıg. 37, Nagarjunakonda (Subramanyam, 1975)

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(42)

River valley : Hemavati Site: Kattebelguli
Rock material: Chlorite schist Tool type: Point (Shouldered)

Description: Made on a thin flake, roughly triangular in shape. Shalow flake scars on the dorsal side. Shoulder on left lateral margin near the top. Plain ventral side. Pointed tip. Patinated. Slightly rolled. Measures 3.5 cm x 2.1 cm x 0.4 cm.

Rare type.

(43)

River valley : Hemavati Site· Kattebelguli
Rock material: Chlorite schist Tool type: Point (Beaked)

Description: Made on thin flake roughly triangular in shape. Shallow flake scars on the dorsal side. Plain ventral side. Wavy left side margin. Retouched and curved tip. Patinated. Slightly rolled. Measures 5.7 cm x 4.3 cm x 1.3 cm.

Comparable roughly to: No. 31, Fig. 24, Kovalli (Pappu, 1974).

(44)

River valley : Hemavati Site· Kattebelguli
Rock material: Chlorite schist Tool type: Point (Double sided)

Description: Made on a thick flake. Two steep flake scars each on both dorsal and ventral side. Mid ridge is wavy on both the surfaces. Thick pointed tip at both the ends. Thick at the centre. Triangular cross section. Patinated. Slightly rolled. Measures 7 cm x 5 cm x 3 cm.

Rare type.

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(45)

River valley : Hemavati Kattebelguli
Rock material: Chlorite schist Tool type: Point (on blade)

Description: Made on a thin blade of brownish colour, shallow flake scars on the dorsal surface. Bulb of percussion on the ventral side. Elongated, thin tip. Faceted patform. Fresh. Measures 8 cm x 4.2 cm x 1.3 cm.

Comparable to: No. 9, Pl. 7, Malaprabha (Joshi, 1980).

(46)

River valley : Upper Tungabhadra Site: Govinkovi
Rock material: Quartz Tool type: Borer

Description: Made on a thin flake rectangular in shape. Step flake scars and patch of cortex on the dorsal surface. Ventral surface is plain and has bulb of percussion. Two deep notches at the upper end to obtain prominent tip. Semi rolled. Measures 6.8 cm x 4.5 cm x 2 cm.

Rare type.

(47)

River valley : Hemavati Site: Kattebelguli
Rock material: Chlorite schist Tool type: Awl

Description: Made on a thin brownish flake. Roughly triangular in shape. Shallow step flake scars on the dorsal side. Bulb of percussion on the ventral side. Thin point protrudes from the middle. Faceted platform. Fresh. Measures 5 cm x 4.5 cm x 0.9 cm.

Comparable to: No. 38, Fig. 24, Kovalli (Pappu, 1974).

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(48)

River valley : Hemavatı Site: Cholenahallı
Rock material: Chlorıte schıst Tool type: Awl

Descrıption: Made on a thın flake roughly trıangular in shape. Shallow flake scars on dorsal side. Bulb of percussıon on ventral sıde. Pointed tip protrudes from the mıddle. Fresh. Measures 4.4 cm x 3.4 cm x 0.5 cm.

Comparable to: No. 35, Fıg. 24, Kovallı (Pappu, 1974).

(49)

Rıver valley : Hemavatı Sıte: Kattebelgulı
Rock materıal: Chlorite schıst Tool type: Chısel edged tool.

Descrıption: Made on a thın bladısh flake. Looks almost lıke a burın. Flakıng at oblıque angle at the top on both the sıdes to obtaın thın sharp left sıde margın. Backed rıght sıde margın. A small vertıcal flake at the top of left margın removed resultıng ın projected tıp. Trıangular ın sectıon. Measures 4.2 cm x 2 cm x 0.9 cm.

Rare type.

(50)

River valley : Hemavatı Sıte: Kattebelgulı
Rock material: Chlorıte schıst Tool type· Chısel edged tool.

Description: Made on a thın bladısh flake; roughly trıangular ın shape. Shallow flake scars at oblıque angle on dorsal sıde. Plaın ventral surface. Mıd ridge straıght and prominent. Vertıcal flake removed at the top of left side margın to obtaın protrudıng poınt. Looks almost like a burin. Patinated. Fresh. Measures 4.5 cm x 2.4 cm x 1.2 cm.

Rare type.

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Figure VII : Blade group

(51)

River valley : Hemavati Site: Kattebelguli
Rock material: Chlorite schist Tool type: Blade

Description: Thin rectangular brownish blade. Shallow step flake scars on dorsal side. Plain ventral side. Symmetrical margins. Patinated. Semi rolled. Measures 4.4 cm x 4.7 cm x 0.9 cm.

Rare type.

(52)

River valley : Hemavati Site: Kattebelguli
Rock material: Chlorite schist Tool type: Blade

Description: Thick elongated blade, rectangular in shape. Shallow fluting like flake scars on the dorsl side. Bulb of percussion and depression on the ventral side. Symmetrical margin. Thick at the centre. Two deep notches near the base may indicate hafting. Thin brownish coat of patination. Rolled. Measures 9.4 cm x 3.9 cm x 2.3 cm.

Rare type.

(53)

River valley : Hemavati Site: Kattebelguli
Rock material: Chlorite schist Tool type: Blade (Tanged)

Description: It is leaf shaped. Shallow flake scars on both the ventral and dorsal sides. Mid ridge is wavy and prominent on dorsal side. Left side margin slightly curved. Serrated margins. Tang at the bottom is deliberate and worked. Slightly rolled. Measures 8.5 cm x 4.3 cm x 1.6 cm.

Comparable to: No. 2, Fig. 45, Tamnihal (Sankalia, 1975).

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(54)

River valley : Tunga Site: Hoisanahalli

Rock material: Quartzite Tool type: Backed knife

Description: Made on a thick brownish flake. Two steep flakes removed at oblique angle to obtain a straight working edge on one side. The other thick convex margin is backed. Zigzag working edge. Semi rolled. Measures 9 cm x 4 cm x 3 cm.

Rare type.

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MIDDLE PALAEOLILTHIC TOOL TYPES

Illustrations

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Fog. I : Hand axe (Miniature), ovate and chopper

Fig. II : Discoids

Fig. III : Side scrapers.

Fig. IV : Round, End and Double sided scrapers

Fig. V : Scraper cum point

Fig. VI : Point group

Fig. VII Blade group

Note : a) Sl.No. of tools provided in the description are common to both drawings as well as plates.

b) Scale of the illustrations (drawings)

Sl.No. 1 to 5 are drawn to 1:½

Sl.No. 6 to 54 are drawn to 1:1

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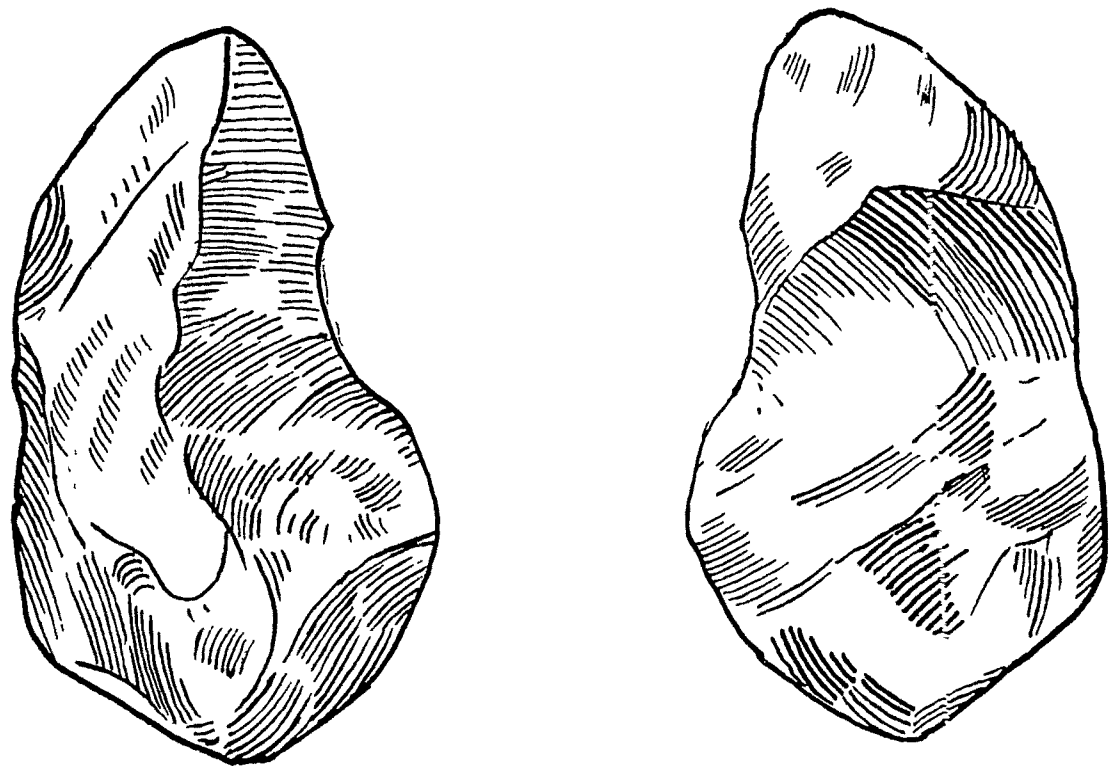
FIG. I: HAND AXE (MINIATURE), OVATE AND CHOPPER



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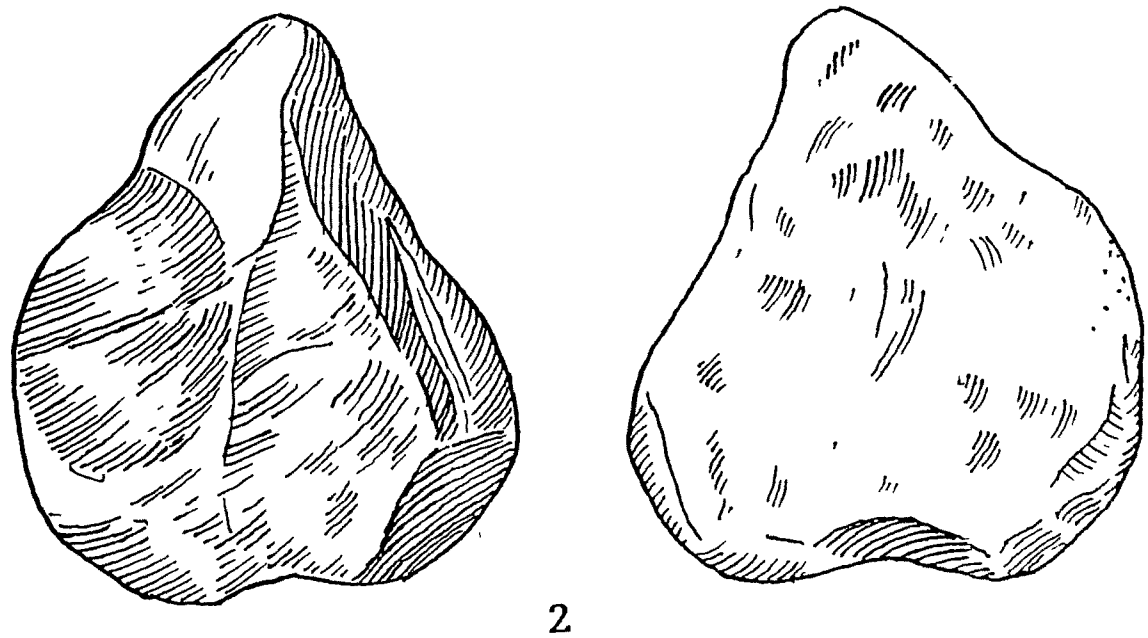

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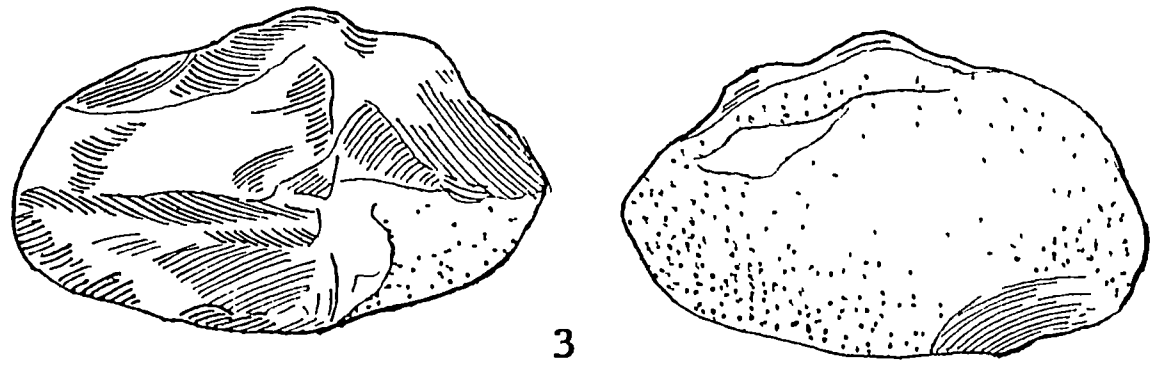

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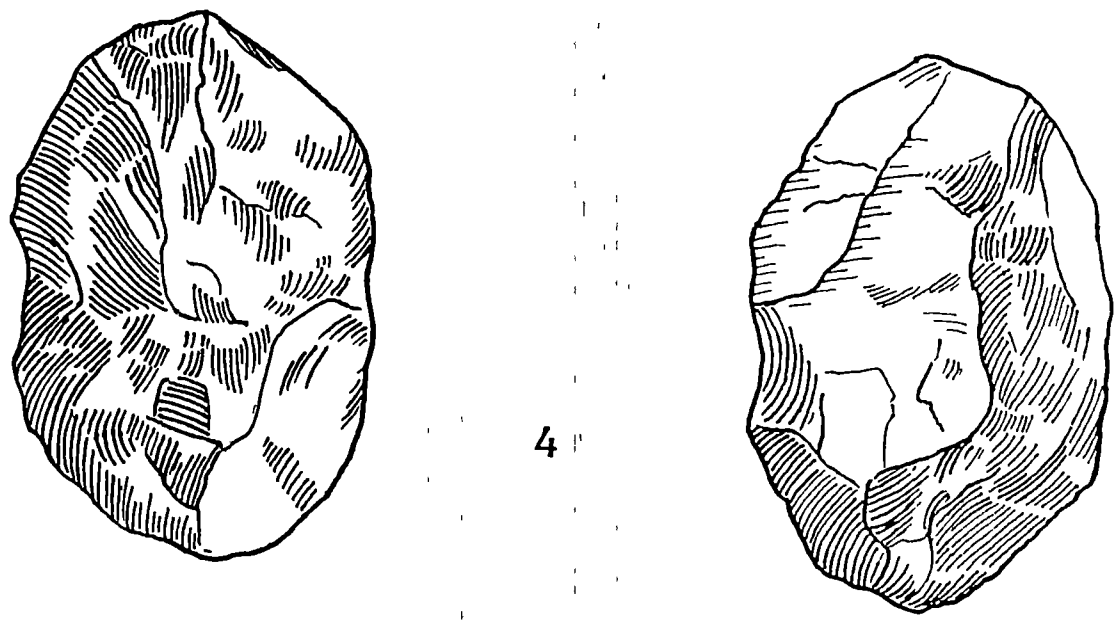

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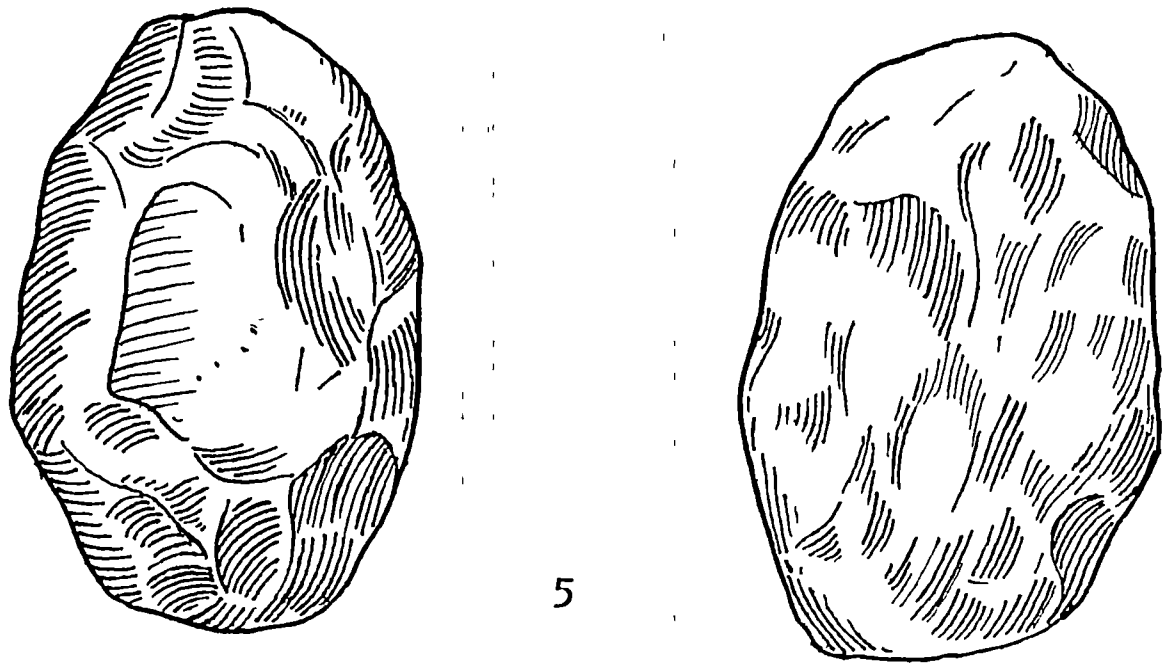

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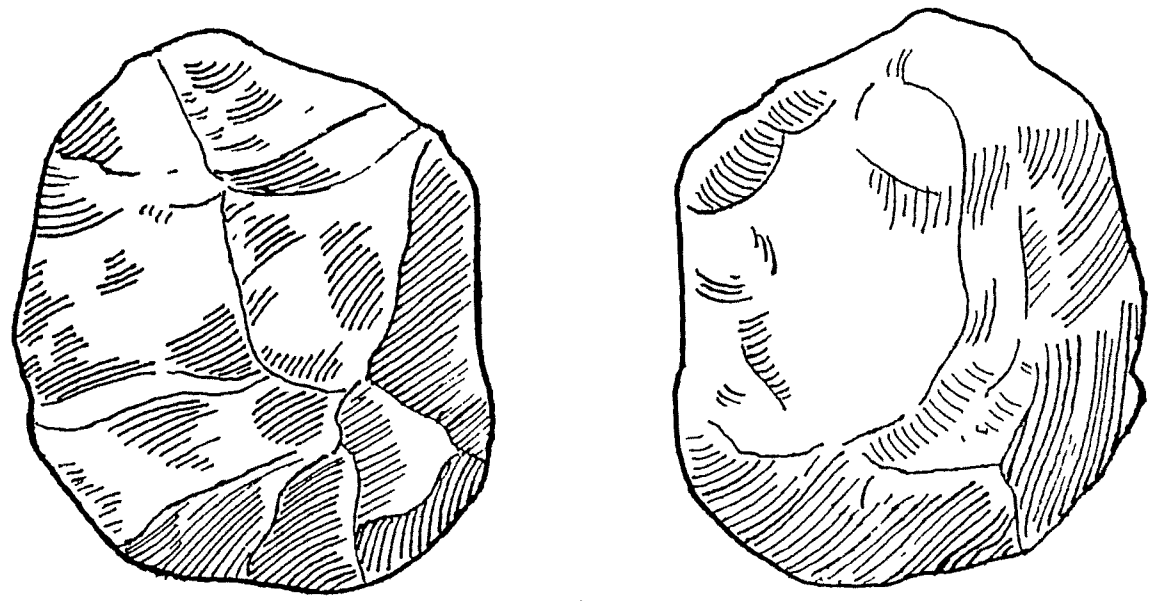
FIGURE II: DISCOIDS



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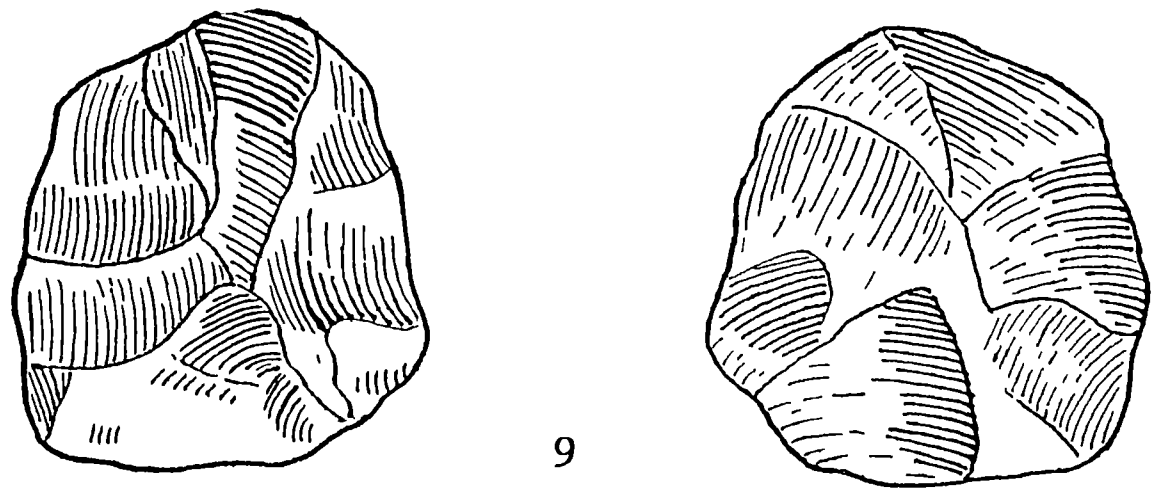

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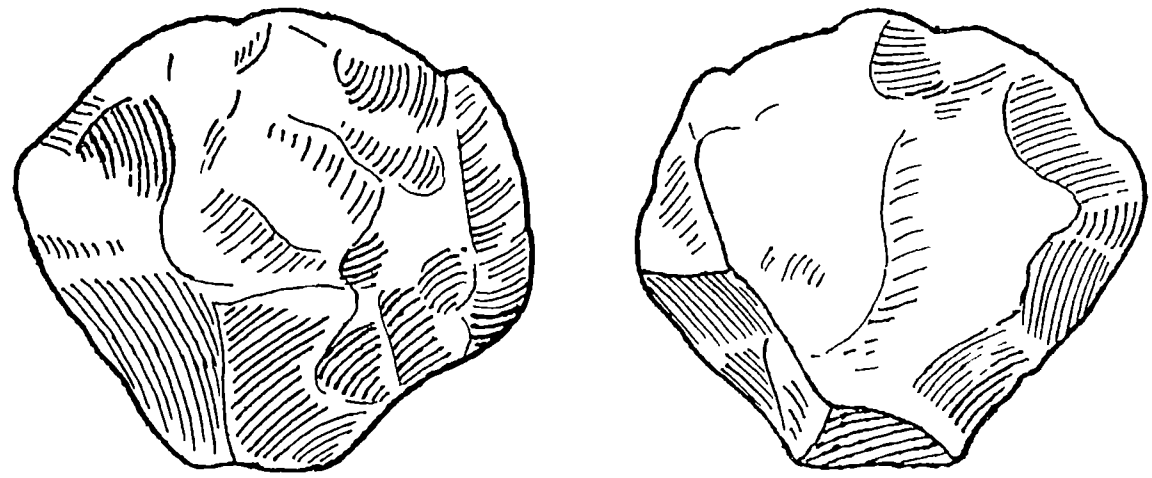

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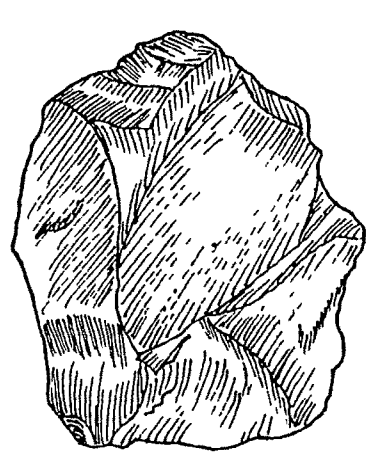
FIGURE III: SIDE SCRAPERS



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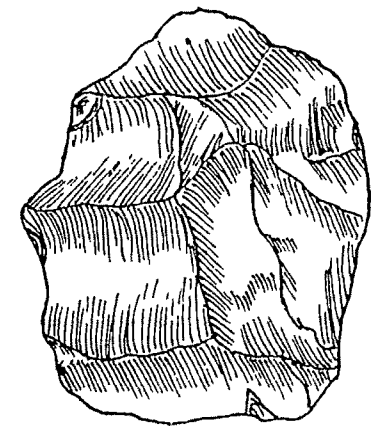

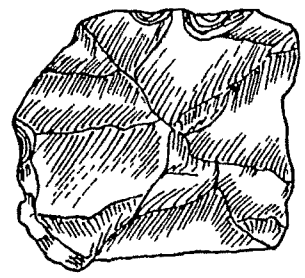

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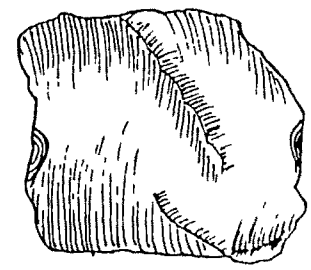

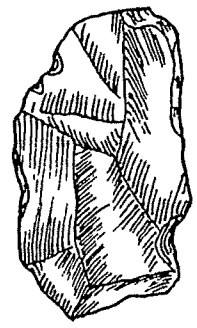

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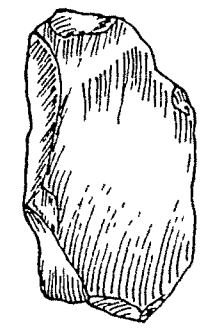

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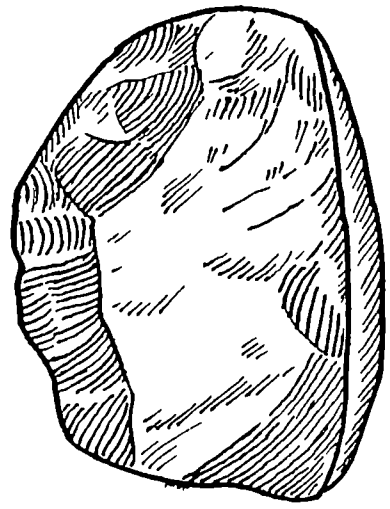

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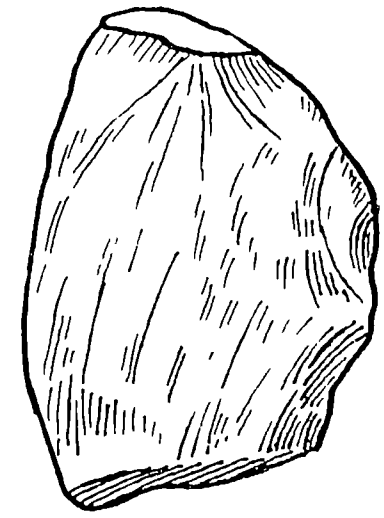

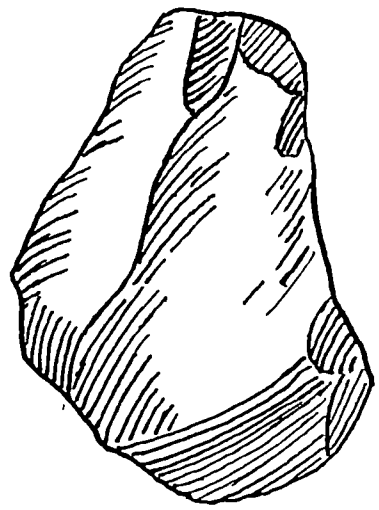

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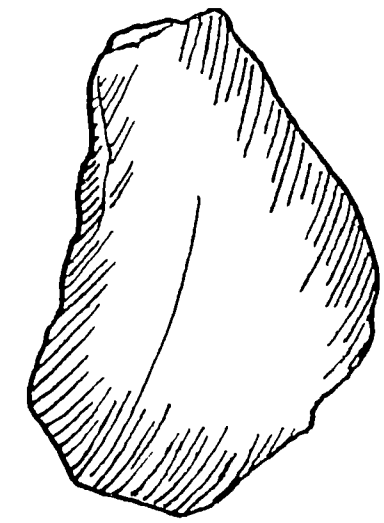

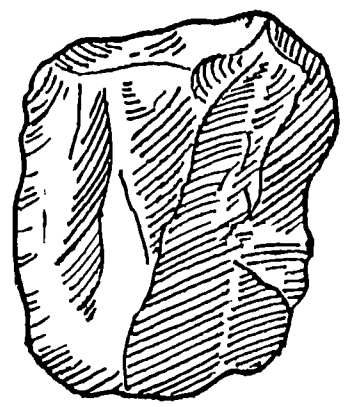

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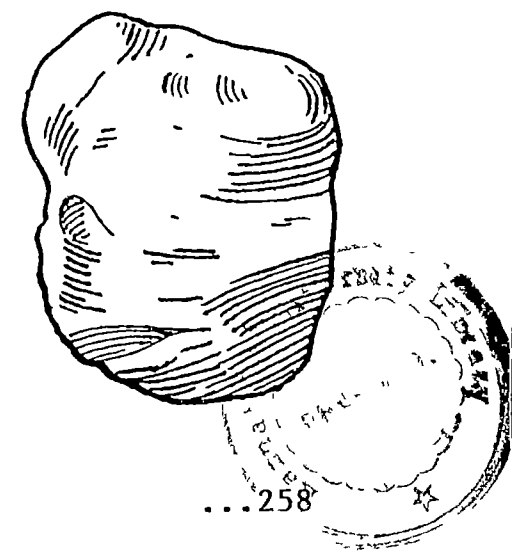
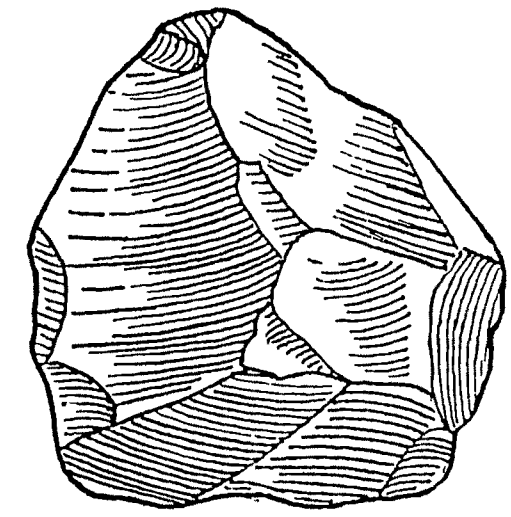


FIGURE IV: ROUND, END AND DOUBLE SIDED SCRAPERS



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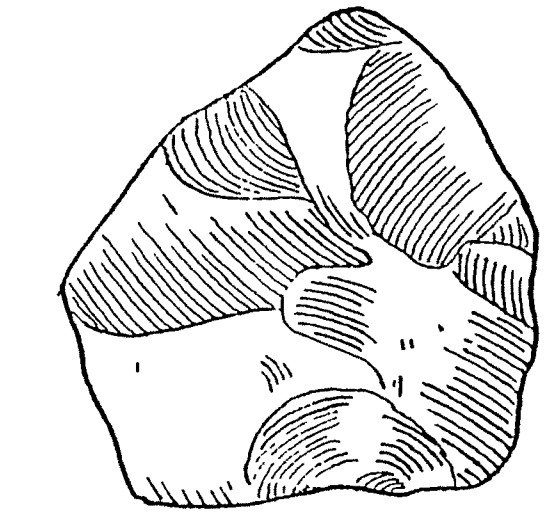

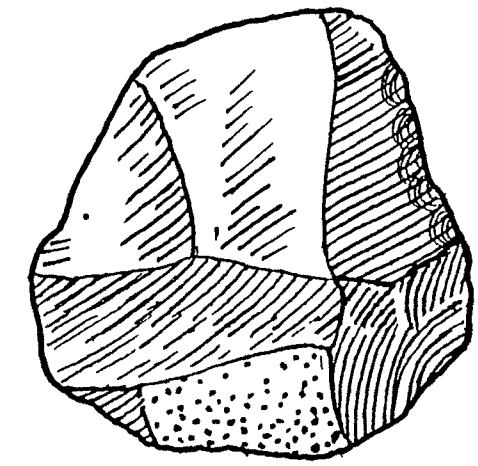

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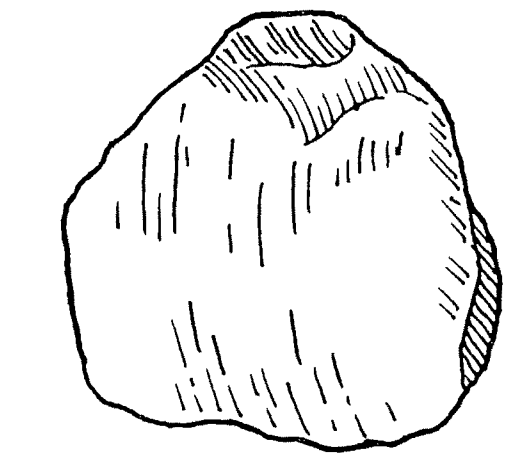

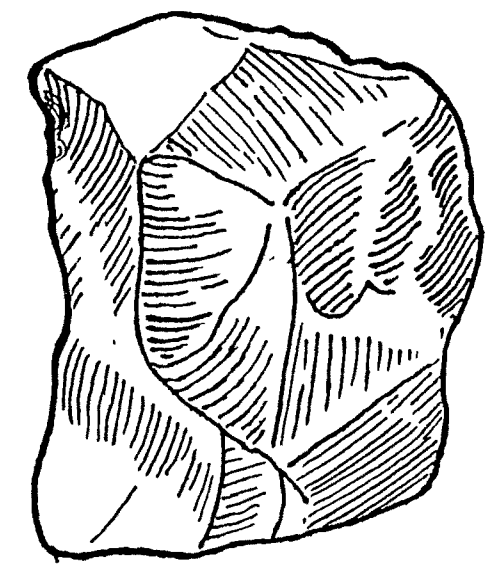

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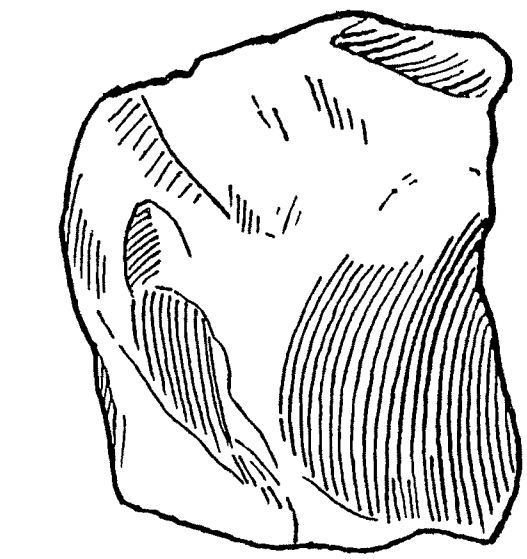

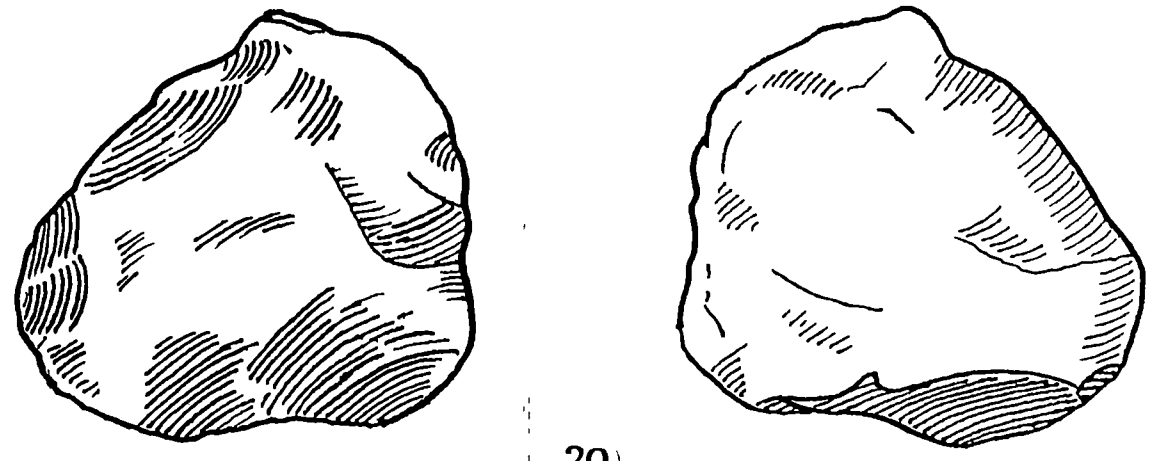

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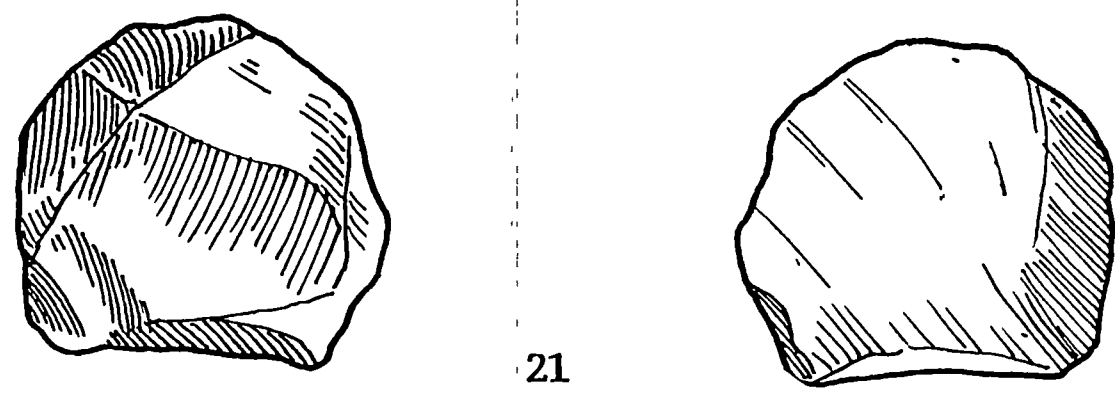

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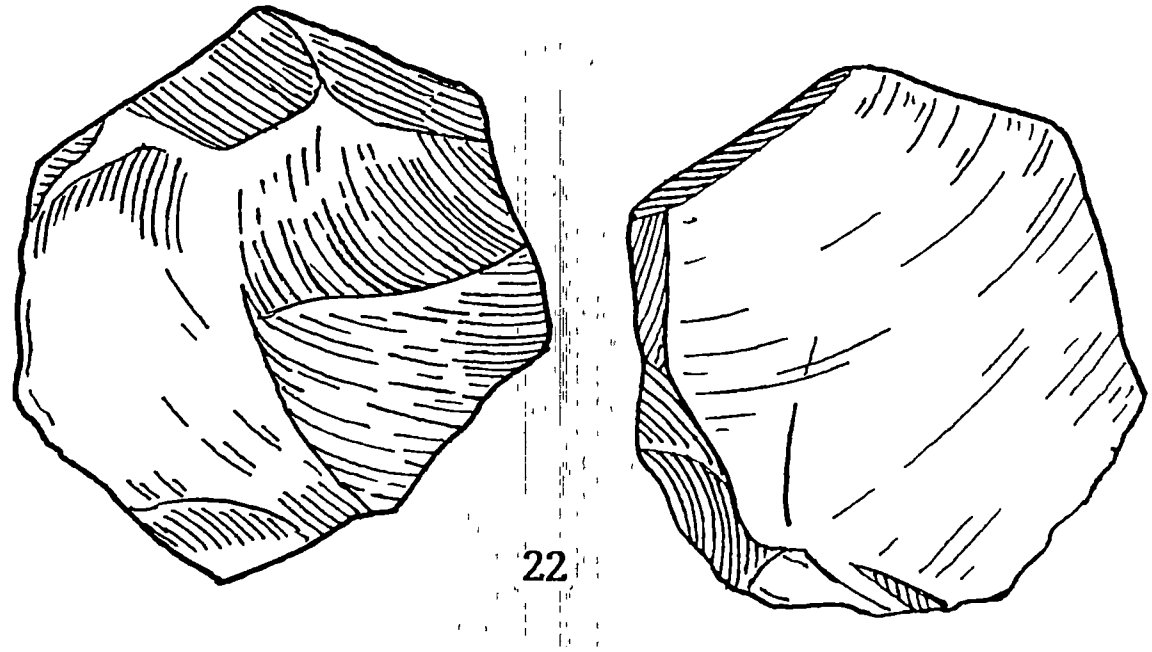

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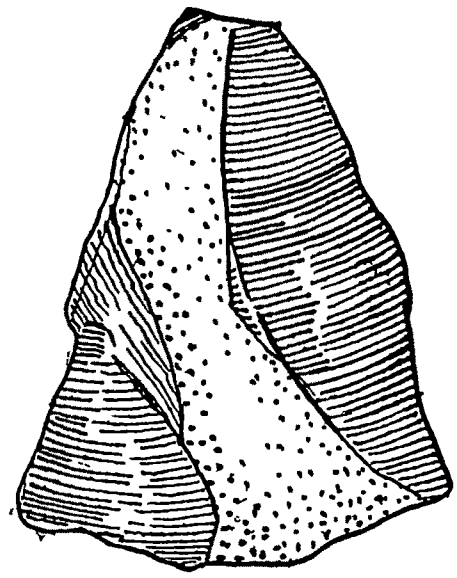

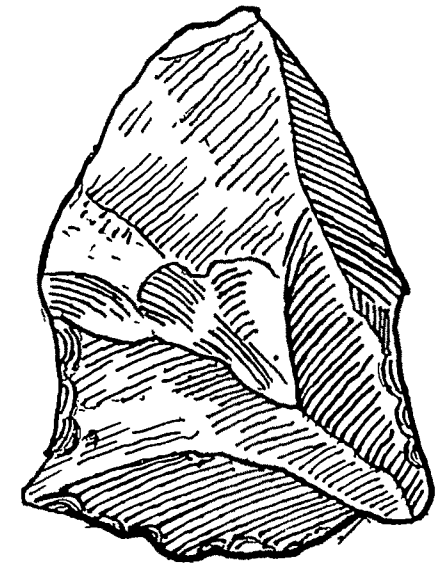

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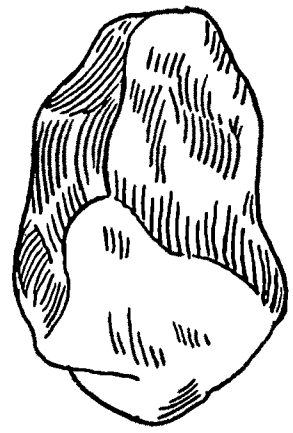

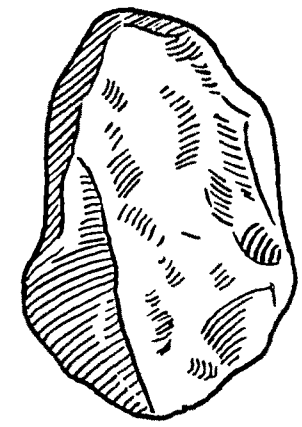

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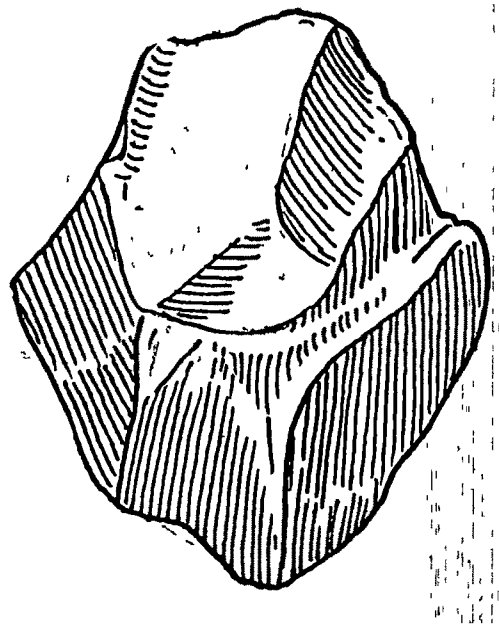

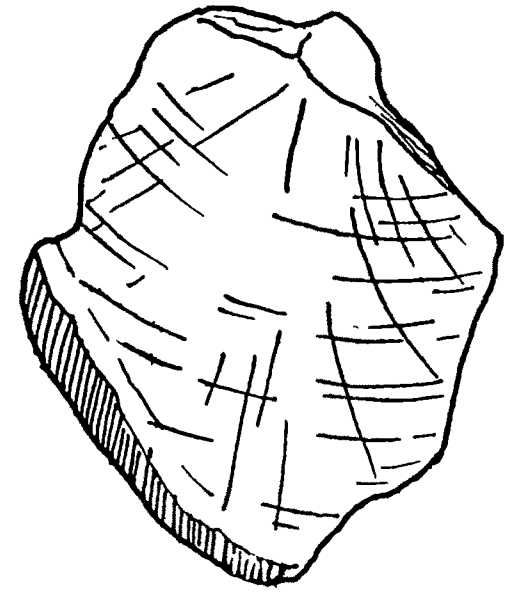

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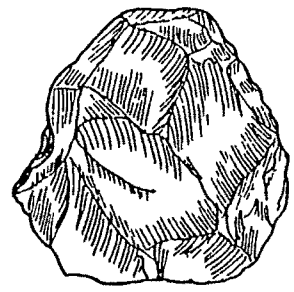

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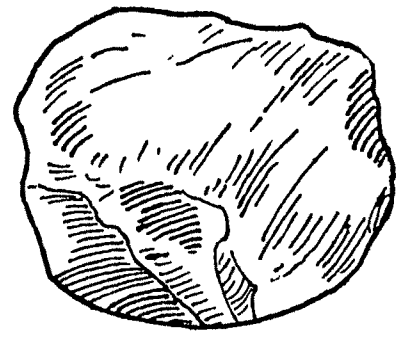

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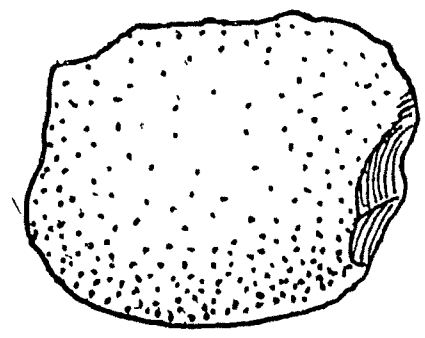

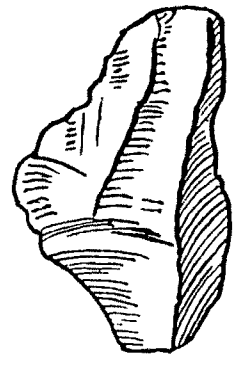

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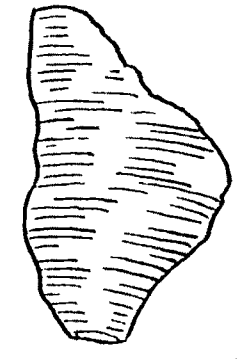

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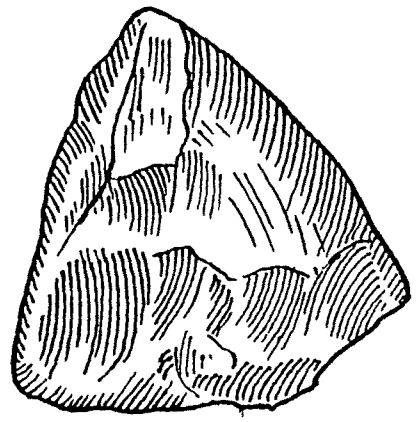
FIGURE V: SCRAPER CUM POINT



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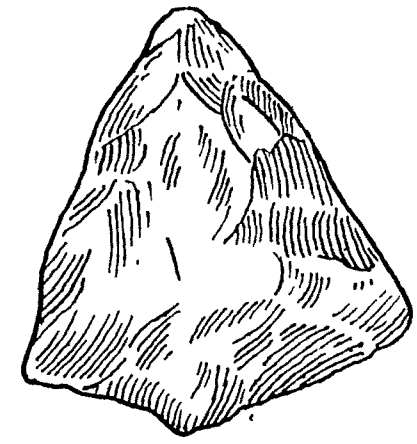

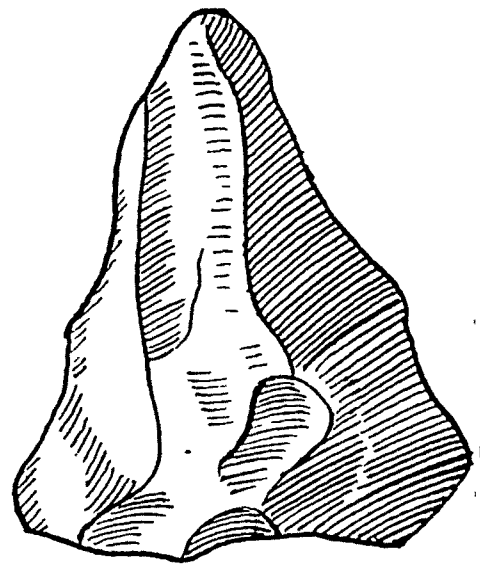

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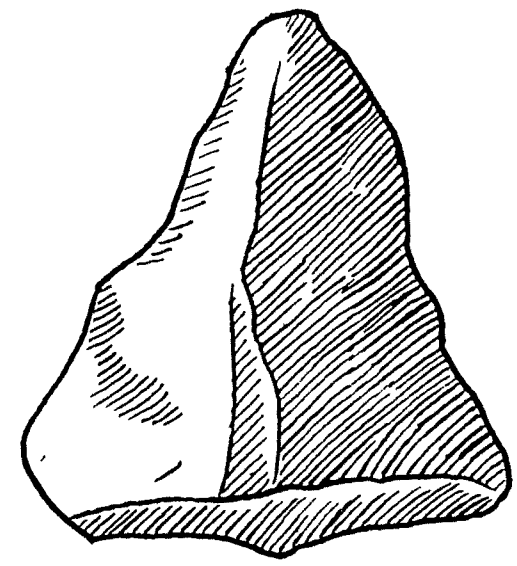

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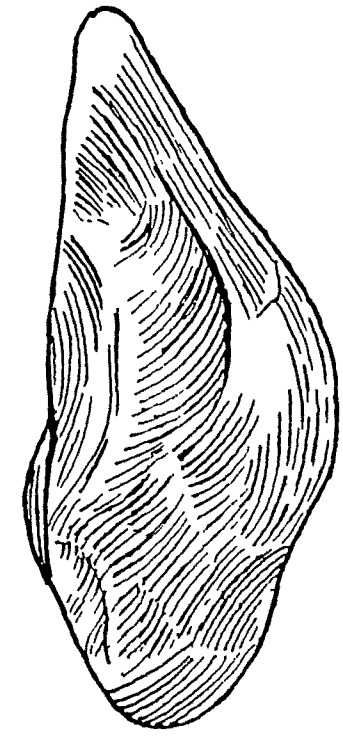

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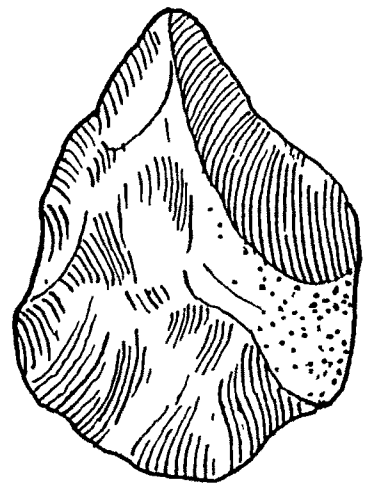
FIGURE VI: POINT GROUP



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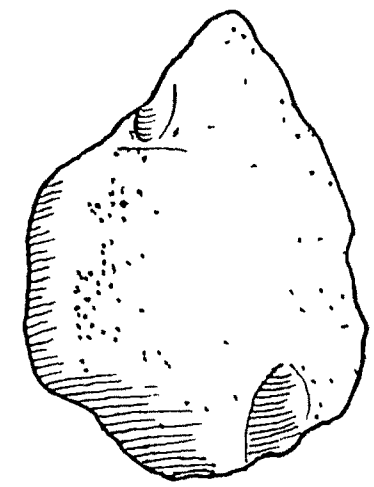

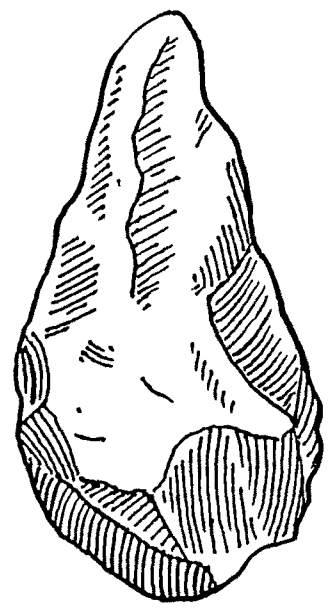

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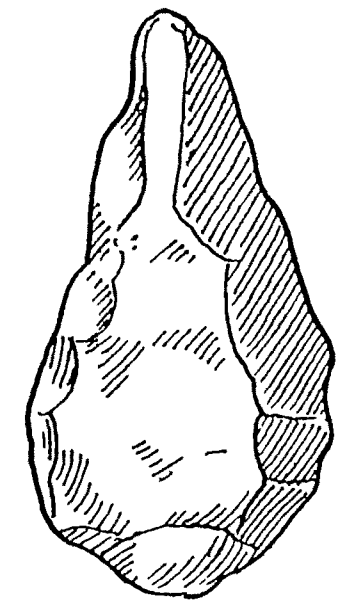

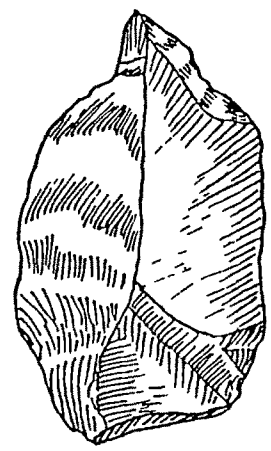

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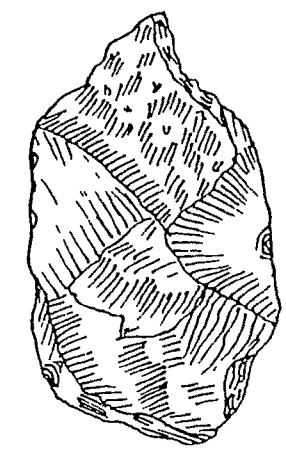

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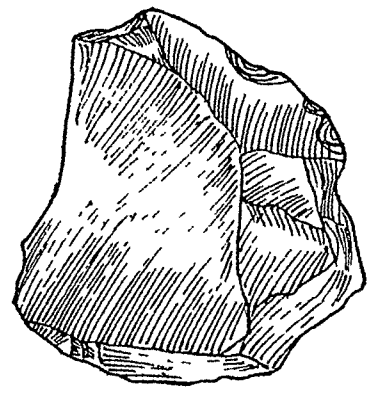

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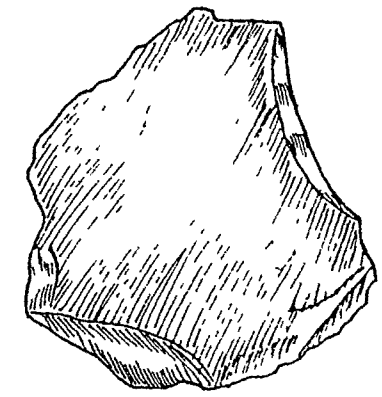

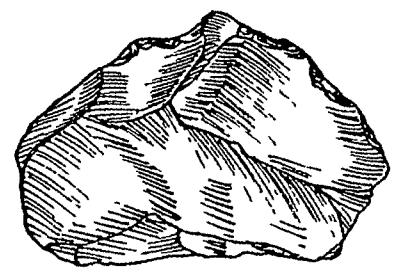

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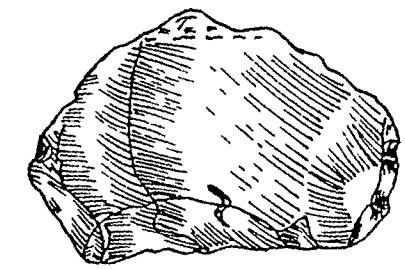

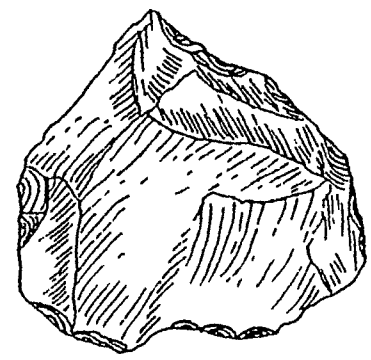

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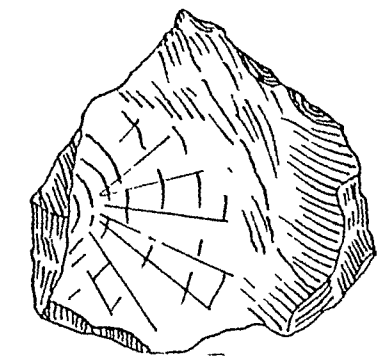

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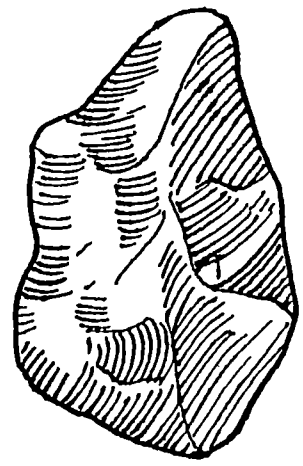

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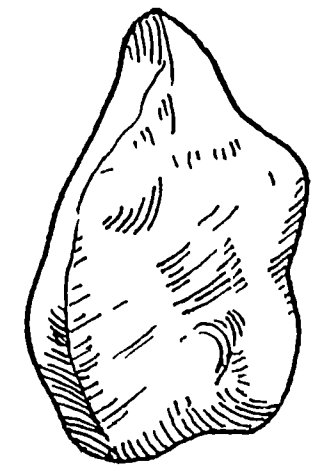

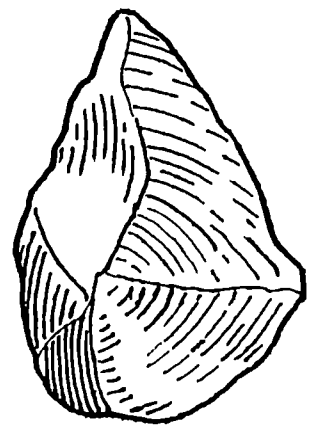

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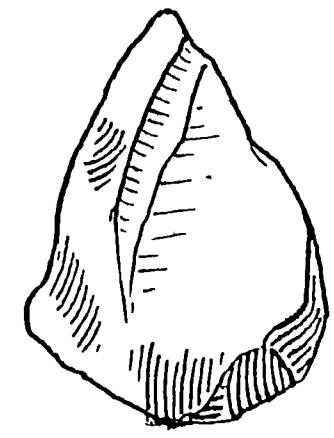

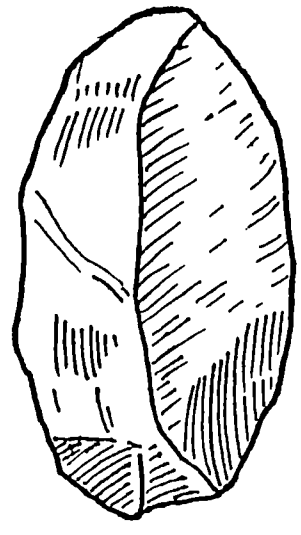

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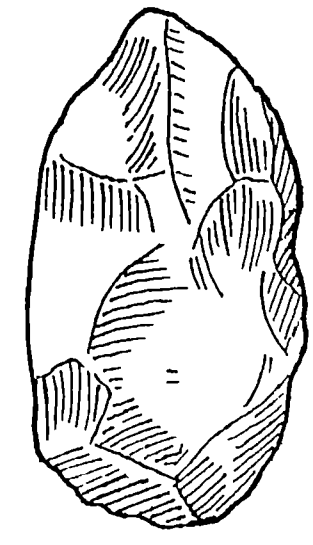

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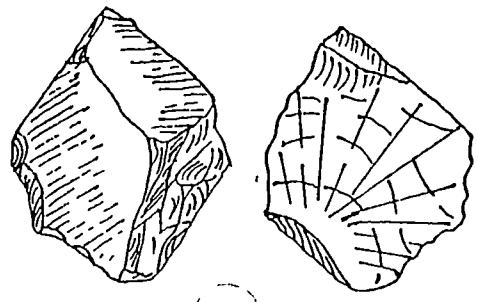

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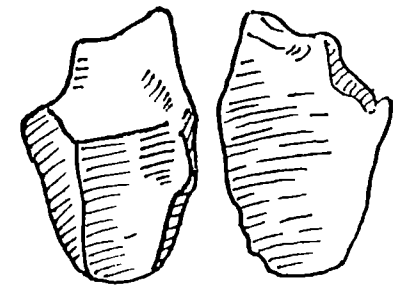

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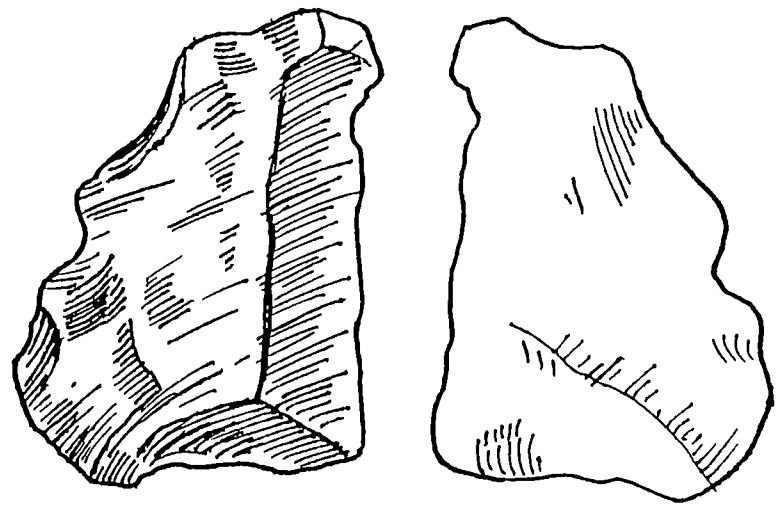

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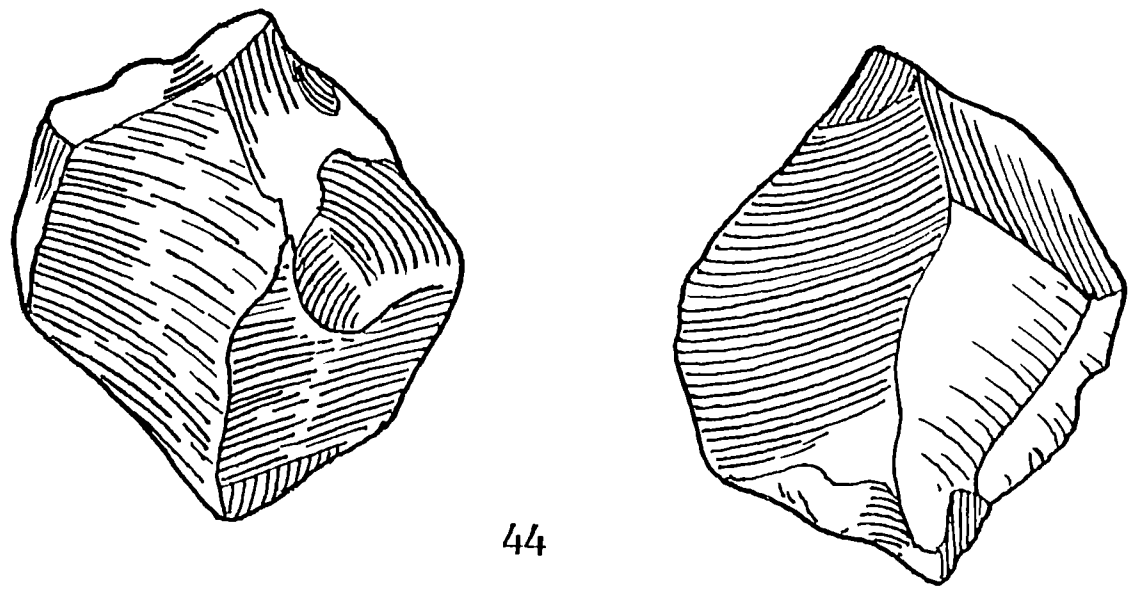

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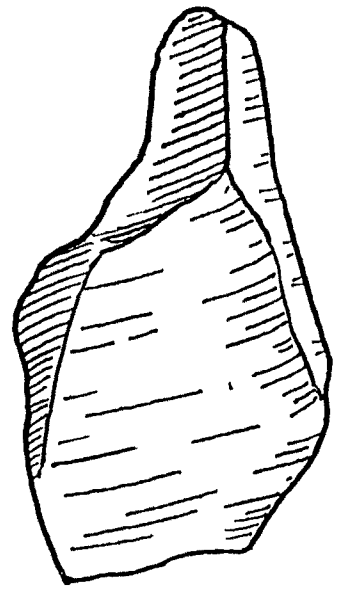

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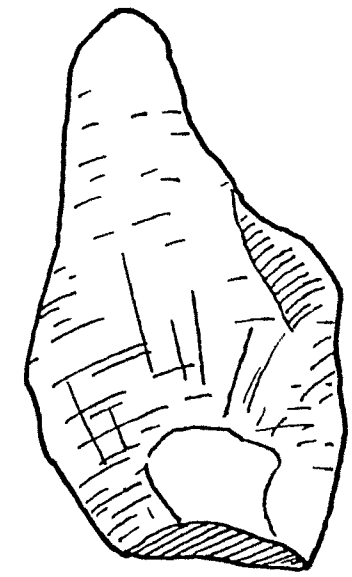

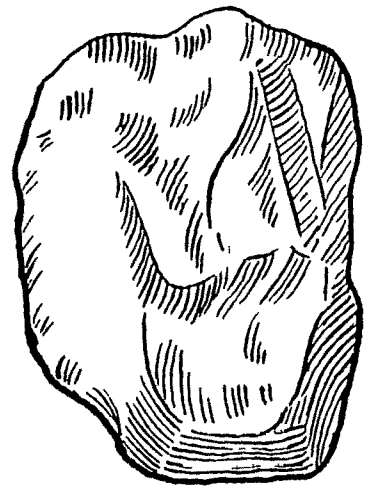

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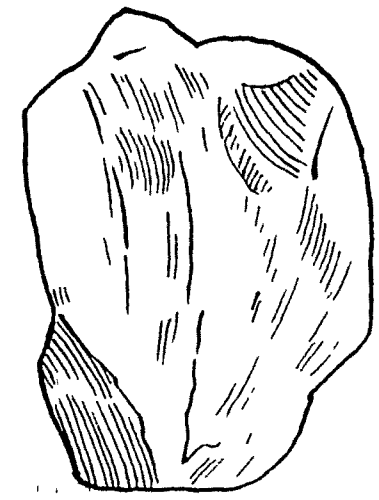

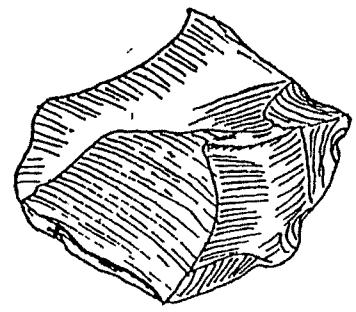

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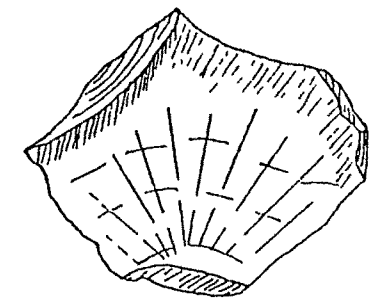

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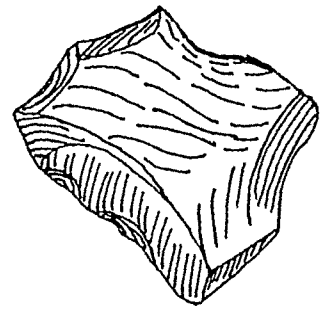

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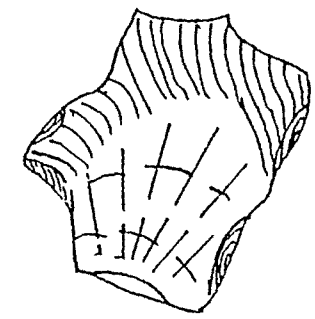

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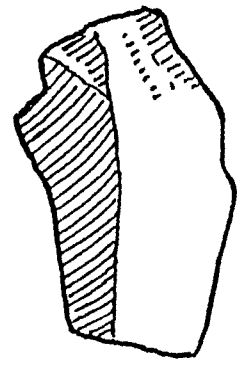

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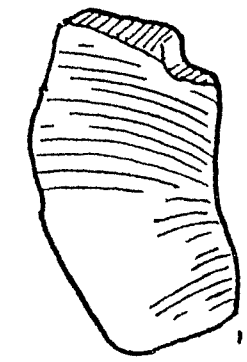

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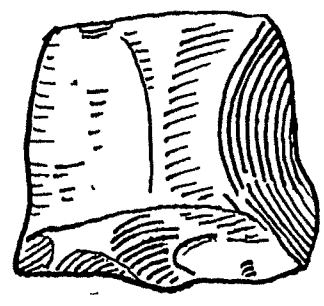
FIGURE VII: BLADE GROUP



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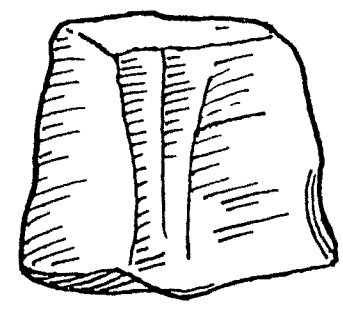

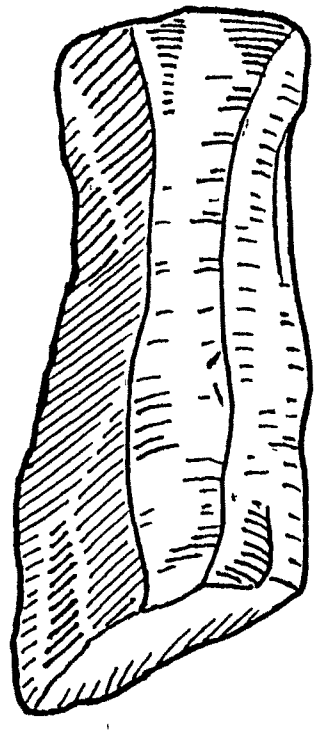

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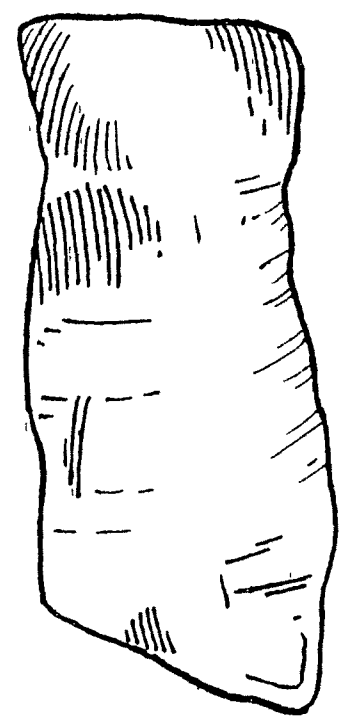

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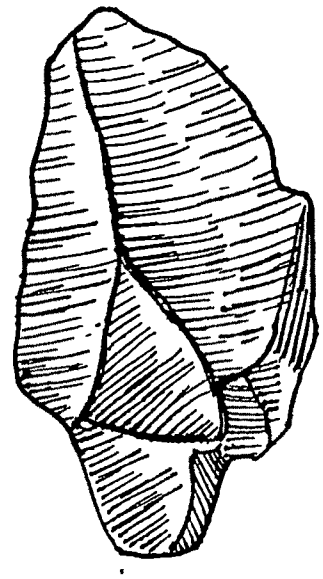

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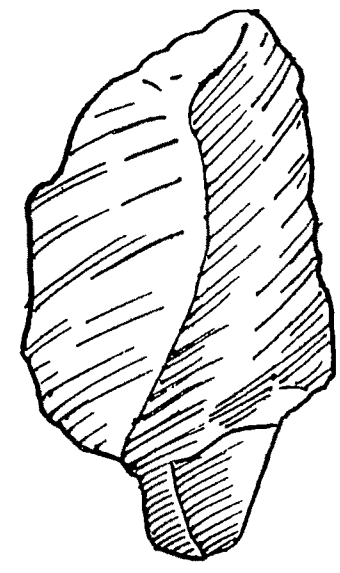

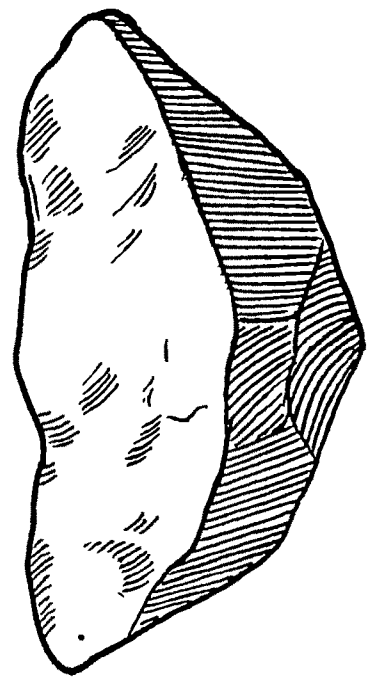

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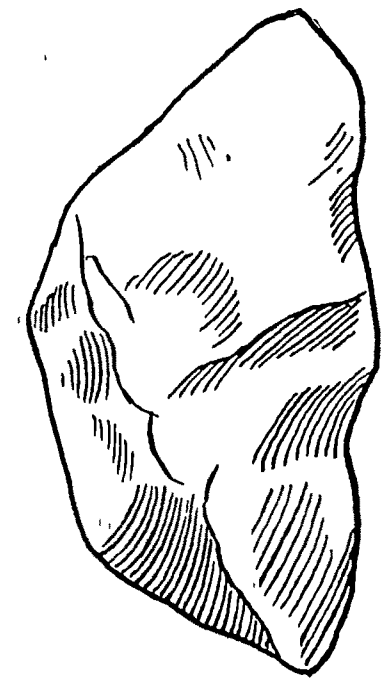

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CHAPTER IV

UPPER PALAEOLITHIC SITES

As a result of intensive archaeological research in the last two decades, widespread evidence of human occupation during the Upper Palaoelithic stage (as noticed elsewhere in the European countries) has come to light in various parts of India. Till about 1960, pre-historians were of the opinion that concrete evidence was lacking to establish Upper Palaeolithic phase in India. Although as early as in 1844 R.B. Foote (1916) compared the bone objects retrieved by him from the excavations at Billasurgam caves in the Kurnool district to the Magdalenian types, it could not be substantiated by further research. After a couple of decades, blade and burin group noticed by Burkitt in Commaide's collection (Commaide and Burkitt, 1930) and classified as series III which reminded him of Upper Palaeolithic character, was also not taken seriously by the subsequent researchers. Observations about this culture after intensive field work, viz. at Kandivili by K.R.U. Todd (1939), at Giddalur II by Zeuner's expedition team (1949) and Sankalia's work at Nevasa (1956) were also discarded probably for lack of stratigraphical evidence.

In the last two decades, considerable systematic work has revealed numerous sites with Upper Palaeolithic assemblages. Excavations in a few of these sites have put the sequential position of this culture firmly above the Middle Palaeolithic phase. Among the Upper Palaeolithic sites noticed so far, the important ones are sites from Kurnool district (Isaac, 1960), Nagarjunakonda (A.I. No. 14, 1958), Renigunta (Murthy, 1968), Vemula (Reddy, 1970), Muchchtla Chintamani Gavi (Murthy, 1974), Yerragondapalem, Waltair (IAR, 1973-74) and sites in the Gunjana valley (D.R. Raju, 1988) all in Andhra Pradesh; Sarang Kheda (IAR, 1973-74), Nanded, Akhatwada, Shankatirth (IAR, 1975-76), Patne (Sali, 1985), all in Maharashtra; Visadi and Budhapushkar, both sand dune sites in Gujarat and Rajasthan respectively (Allchin, 1974), Bhimbetka and sites in the Rewa district of Madhya Pradesh (IAR, 1975-

76), sites in the Belan and Son valleys in Uttar Pradesh (Mishra, 1977) and Singhbhum in Bihar (Ghosh, 1970).

Although these sites can not be compared chronologically with the Upper Palaeolithic sites in the Western Europe where decorated bone objects and tools and paintings are considered to become of the characteristic features of this culture, a few sites in India have also thrown some light on the use of bone for tools. The earliest of these is reported from Billasurgam caves by R.B. Foote (1916). A decade back, bone tools were found in stratified context, at Muchchatla Chintamani Gavi (Murthy, 1970). Excavations at Patne (Sali, 1985) also revealed ostrich eggshell pieces with simple criss-cross designs between horizontal lines representing direct evidence of Upper Palaeolithic art in India. Besides ostrich shell beads, one bead of shell has also been reported from this site. Wakankar has reported decorated ostrich shells from Bhopal (Sali, 1985).

After thoroughly examining the chert blades from Salvadgi discovered by Sundara (IAR, 1960-61), Seshadri (1962) postulated the presence of Upper Palaeolithic culture in Karnataka. Since then, couple of sites have been reported but are concentrated only in the northern Karnataka region and none in southern Karnataka. The sites reported from northern Karnataka include Neralbhavi, Gulbal, Benhatti and Hunsgi, all in Shorapur doab (Paddayya, 1970). These sites are situated near Salvadgi where chert blades occur in large number. Tool assemblage of these sites comprises of blades, burins, tanged points, multiple tools, borers, etc., all made on reddish brown chert (Paddayya, 1970). Against this background, intensive explorations in the region under study by me did not yield any result in the first attempt. However, in the subsequent explorations done recently, I could locate a solitary true Upper Palaeolithic site at Thakkanahalli in the Upper Tungabhadra valley, where artefacts of the preceeding and the succeeding cultures also occur along with the Upper Palaeolithic tools, a feature almost similar to the sites in the Kurnool and

Chittoor districts of Andhra Pradesh. Although a single site is located, it is bound to throw more light on this culture and has helped to bridge the gap between the Middle Palaeolithic and the Mesolithic in the region under study.

The site at Thakkanahalli is located at about 200 m west of the village and is 80 m towards the east of the right bank of the river Tungabhadra. The site measures 100 m east-west x 50 m north-south. Semi-jungle of thorny bushes occur around the site which is now under cultivation. Large number of unfinished flakes, waste flakes and nodules are found scattered and therefore appears to be a factory site or a work camp. Gneiss outcrops in the vicinity seem to have been used as working arcade as is evident from few waste flakes scattered around.

Stratigraphy: As already mentioned above, Upper Palaeolithic artefacts in the region under study are found in association with the Middle Palaeolithic and Mesolithic tools. Elsewhere in northern Karnataka, Upper Palaeolithic phase appears in a seperate horizon of black-brown loose granular gravel resting on brown silt below which occurs Middle Palaeolithic artefacts (Paddayya, 1970). At Thakkanahalli, Upper Palaeoliths were found exposed in the ploughed tracts, evidently at a depth of 15-20 cm embedded in blackish brown granular soil. Whether the artefacts occur in a seperate strata in the site requires further investigation. At Nallagundlu (Chittoor district, Andhra Pradesh) in a rich factory site where Mesolithic tools also occur, blade-burin artefacts were found at a depth of 8 inches below the surface (Murthy, 1970). Similar feature could be postulated at Thakkanahalli also since the Upper Palaeoliths are found only when the field is ploughed. However, these observations require further study.

Environment: The mixed occurrence of tools of three cultures in the site makes it rather difficult to postulate definite inferences. Considering the present vegetation, rain fall, etc., in the Upper

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Palaeolithic times, open wood land and also areas with perennial water source seem to have been preferred in this region. However, these observations are tentative.

Rock material: The Upper Palaeolithic assemblage of Thakkanahalli is made on three types of raw materials, viz., chert, cherty agate, quartz and quartzite. Chert of brown, black, grey colours have been used profusely. The banded cherty agate contains bands of iron ore. Artefacts made on quartz of white and blue colours are the second largest group in the assemblage. Blueish opalescent quartz has been used to prepare points. Quartzite with bands of feldspar have also been used but in a small quantity. The large percentage of crypto-crystelline silica in the quartzite makes it not susceptible for concoidal fracture which explains for the small quantity of tools made on quartzite. This material has been collected from the veins of in the nearby schist belt in the upper reaches.

THE UPPER PALAEOLITHIC ASSEMBLAGE

Paddayya (1970; 172-185), while discussing the Upper Palaeolithic tool assemblage from Shorapur doab, has classified the artefacts based on the nature of working end into three groups; viz., (1) Edged tools; (2) non-edged tools and (3) multiple tools. In the edged tool group, working margins are at the distal end or on either of the margins. Non-edged tool group comprises of points and borers while the multiple tool group is a combination of both edged and non-edged tools. Of the three, the first group is dominating with high percentage of blades of various types and burins. The Thakkanahalli assemblage under discussion also exhibits similar groups with high percentage of blades followed by burins and points. Interestingly, scrapers form a main type in the Upper Tungabhadra assemblage. In this context, occurrence of scrapers in the blade and burin industries from Andhra Pradesh (Murthy, 1970) is noteworthy. For the sake of convenience and to fecilitate comparison with the nearest Upper Palaeolithic assemblage,

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Paddayya's clarification has been followed in general but the types have been discussed and analysed seperately.

The main tool types available in the assemblage have been classified as follows:

Table No. 48

Typological distribution of artefacts from Thakkanahalli, Upper Tungabhadra

Sl. No.	Tool type	Total No.	Percentage
1	Simple blade	29	39.72%
2	Notched blade	4	5.48%
3	Obliquely blunted pen knife blade	3	4.11%
4	Bakced blade	3	4.11%
5	Beaked burin	5	6.85%
6	Single blow burin	3	4.11%
7	Bec-de-flute burin	3	4.11%
8	Side scraper on flake	7	9.58%
9	End scraper on flake	5	6.85%
10	Simple point	3	4.11%
11	Notched point	3	4.11%
12	Point cum blade	2	2.74%
13	Borer	3	4.11%
		73	100.00%
14	Core	11	15.71%
15	Debitage	59	84.79%

It is evident that the blade and burin group is dominant with 68.49% followed by scraper and point/borer group with 16.42% and 15.09% respectively.

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Typology

Blade group: Blades constitute the largest group in the collection accounting for 39.73%. Blades made on chert and quartz with 63.16% and 36.84% respectively could be distinguished. While in the chert group, medium to small sized thin flakes are preferred, the quartz group is characterised by thick medium size flakes. All the artefacts exhibit prominent mid rib and slopy flaking on one or both the sides. Few have retained cortex patches. Working edge is visible. Prominent bulb of percussion is invariably noticed.

Table No. 49

Measurement of the Upper Palaeolithic blades in the Upper Tungabhadra

(Metrical analysis of simple blades)

a) Chert group:

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	21 mm	17 mm	6 mm
2	21 mm	22 mm	7 mm
3	25 mm	11 mm	8 mm
4	26 mm	11 mm	7 mm
5	26 mm	10 mm	6 mm
6	26 mm	16 mm	9 mm
7	30 mm	25 mm	9 mm
8	30 mm	28 mm	12 mm
9	31 mm	22 mm	7 mm
10	33 mm	15 mm	8 mm
11	33 mm	12 mm	12 mm
12	34 mm	32 mm	9 mm
13	35 mm	19 mm	13 mm
14	36 mm	26 mm	13 mm
15	39 mm	20 mm	10 mm

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Sl. No.	Maximum length	Maximum breadth	Maximum thickness
16	39 mm	26 mm	10 mm
17	43 mm	31 mm	8 mm
18	44 mm	29 mm	10 mm
19	49 mm	27 mm	13 mm
20	58 mm	29 mm	11 mm
21	60 mm	32 mm	19 mm

b) Quartz group:

Sl.No.	Maximum length	Maximum breadth	Maximum thickness
1	38 mm	20 mm	10 mm
2	41 mm	41 mm	11 mm
3	44 mm	30 mm	11 mm
4	50 mm	36 mm	16 mm
5	50 mm	39 mm	19 mm
6	52 mm	26 mm	18 mm
7	54 mm	27 mm	19 mm
8	55 mm	39 mm	16 mm

The material analysis of chert group indicates that the thickness and length vary considerably. This variation is probably due to the use of even the smallest flake of chert. However, in the quartz group, variations are comparatively less. The maximum length, breadth and thickness being 60 mm, 39 mm and 19 mm respectively.

Notched blade: These are made on broad and elongated blades accounting for 4.11% of the total collection. Bulb of percussion in the quartz artefacts are not prominent while the one made on quartzite has it prominently. High mid rib with slopy sides. Single or multiple notches on one or both the lateral margins. Devoid of secondary retouch. Prepared platform in the quartzite artefact is noteworthy.

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Table No. 50

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	55 mm	34 mm	16 mm
2	60 mm	35 mm	13 mm
3	73 mm	34 mm	19 mm
4	75 mm	30 mm	15 mm

The above analysis indicates uniformity in the size of the artefacts. The average length, breadth and thickness measure 66 mm, 33 mm and 16 mm respectively.

Obliquely blunted pen knife blade· This group comprises of three artefacts, two made on brownish chert and one made on cherty agate accounting for 4.11% of the total collection. Small patch of cortex is retained near the base. Prominent bulb of percussion. Numerous flutings on the dorsal side. Ventral side is worked in one artefact. The curved distal end is obtained by obliquely blunting it on the left lateral margin. Flaking on dorsal side slopes towards the right margin. Working edge is retouched.

Table No. 51

Metrical analysis

Sl.No.	Maximum length	Maximum breadth	Maximum thickness
1	39 mm	14 mm	8 mm
2	40 mm	21 mm	11 mm
3	43 mm	16 mm	14 mm

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The average length, breadth and thickness measure 46 mm, 17 mm and 11 mm respectively.

Burin: Burin forms one of the important tool types in the Upper Palaeolithic tool kit. Many forms of burins are reported from various sites in India. In the north Karnataka, Upper Palaeolithic assemblage Paddayya (1970; 177-180) has identified seven sub-types of burins based on technique of manufacture and types and names are given. To facilitate comparison, the present collection from Thakkanahalli have also been classified on similar lines and have been described type-wise retaining the nomenclature. There are in all 12 specimens. Of these, one is made on core, three are made on thick flakes, three on thick blades and five specimens are made on small, thin, bladish flakes. All have working edge on one side. Both thinner and robust sides have been used to obtain burin edge by removing one or more thin and narrow spalls or flutings. These spalls are removed vertically and from different angles or obliquely along the lateral margins and near the transverse plan. Thus, based on trimming of the burin edge, these 12 specimens could be put under three categories, namely, (a) beaked burins, (b) single blow burins and (c) bec-de-flute burins.

(a) Beaked burins: This group accounts for 6.84% of the total collection. Of the five specimens, two are made on thick blades and the remaining three are made on thin bladish flakes. All the specimens exhibit working on the dorsal side. Shallow fluting is noteworthy. Two specimens show profuse working on the ventral side while the remaining three have prominent bulb of percussion. High mid rib and slopy sides. Burin edge is achieved at the thick distal end by removing single or multiple spalls. Working edge is on the right margin in four while the fifth one has it on the left margin. Intersection of spalls in four specimens is noteworthy.

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Table No. 52

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	21 mm	14 mm	6 mm
2	28 mm	15 mm	8 mm
3	29 mm	17 mm	7 mm
4	41 mm	19 mm	11 mm
5	42 mm	19 mm	12 mm

The average length, breadth and thickness of burins on thick blade measure 42 mm, 19 mm and 12 mm respectively, whereas those on the thin bladish flakes measure 26 mm, 18 mm and 10 mm respectively.

(b) Single blow burins: This group account for 4.11% of the total collection. One is made on a thick flake while the remaining two are made on thin bladish flakes. Shallow flake scars on the dorsal side. Prominent bulb of percussion is seen on ventral in one specimen. Burin edge obtained by removing single vertical spall from the thick side in the big one and thin sides of the small specimens, on the left lateral margin.

Table No. 53

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	21 mm	13 mm	7 mm
2	23 mm	12 mm	10 mm
3	41 mm	21 mm	14 mm

The maximum length, breadth and thickness of the burin made on thick flake measure 41 mm, 21 mm and 14 mm respectively while the average measurement of the remaining artefacts are 22 mm, 13 mm and 8 mm respectively.

c) Bec-de-flute burins: This group accounts for 5.48% of the total collection. One is made on a core, two are made on thick flakes and another is made on a blade. Working on dorsal surface. Prominent bulb of percussion on the ventral side. Burin edge is achieved by removing thin or thick angular spalls from opposite sides at the thick distal end.

Table No. 54

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	32 mm	15 mm	12 mm
2	38 mm	20 mm	9 mm
3	40 mm	24 mm	19 mm
4	43 mm	22 mm	16 mm

The average length, breadth and thickness measure 38 mm, 20 mm and 14 mm respectively.

Scraper: Side scrapers form one of the the important groups accounting for 9.58% of the total collection. These are made on thick flakes almost rectangular in form. Prominent longitudinal mid ridge. Ventral side has prominent bulb of percussion. Lateral margin is worked on one or both the sides. 50% artefacts exhibit secondary retouching and small patch of cortex is also retained in a few. The same specimens also show steps. Blunt edges indicate use marks.

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Table No. 55

Metrical analysis of the scrapers (single edged)

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	39 mm	39 mm	14 mm
2	44 mm	33 mm	12 mm
3	44 mm	40 mm	15 mm
4	46 mm	34 mm	16 mm
5	46 mm	37 mm	16 mm
6	51 mm	40 mm	15 mm

The analysis indicates uniformity of size and thickness irrespective of the raw materials used. Average length, breadth and thickness measure 37 mm, 22 mm and 15 mm respectively.

End scraper· End scrapers account for 6.84% of the total collection. In this group are five artefacts having similar features of scrapers mentioned above. The convex working edge at the distal end is achieved by removing flakes at steep angle and retouched. Fluting is noteworthy.

Table No. 56

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	32 mm	26 mm	11 mm
2	36 mm	17 mm	14 mm
3	38 mm	22 mm	9 mm
4	41 mm	32 mm	13 mm
5	48 mm	34 mm	14 mm

The maximum length, breadth and thickness measure 48 mm, 34 mm and 14 mm respectively and are in conformity with the above side scraper group.

Simple point: These are made on thick blades. Two are made on chert and one on quartz accounting for 4.11% of the total collection. These have prominent mid rib and slopy sides. Point is attained by obliquely blunting the lateral margins near the distal end. Thick near the base. Fluting is noteworthy.

Table No. 56

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	24 mm	18 mm	8 mm
2	38 mm	15 mm	10 mm
3	45 mm	17 mm	13 mm

The average length, breadth and thickness measure 36 mm, 17 mm and 13 mm respectively.

Notched point: These are made on broad and thick flakes of quartz and chert accounting for 4.11% of the total collection. Working point is attained by producing a notch near the distal end and the margins are blunted by retouching. Numerous shallow flake scars on the dorsal surface. Ventral is plain in two artefacts. Patch of cortex is retained in the chert artefact which also exhibits incipient tang.

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Table No. 57

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	29 mm	24 mm	7 mm
2	32 mm	32 mm	16 mm
3	38 mm	29 mm	14 mm

The maximum length, breadth and thickness measure 38 mm, 32 mm and 16 mm respectively.

Point cum blade: In this group, two artefacts made on quartz of blue and white colour are identified. These are made on thick blades accounting for 2.74% of the total collection. Both are bifacially worked. One of the thin lateral margins is used as working edge. Point is attained by removing small flakes near the distal end from both the sides. However, in one artefact, a single vertical spall is removed to strengthen the point. Both have convex margins on one side and the other side is steep. Both are thick near the base.

Table No. 58

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	47 mm	16 mm	14 mm
2	64 mm	21 mm	16 mm

The average length, breadth and thickness measure 29 mm, 20 mm and 17 mm respectively.

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Borer: These are made on thick short blades of chert accounting for 4.11% of the total collection. Working point is attained at the middle of the convex distal end by obliquely blunting the side margins. Tip is very tiny and sharp. Slopy dorsal surface with shallow flake scars, plain ventral surface and prominent mid rib are noteworthy features.

Table No. 59

Metrical analysis

Sl. No.	Maximum length	Maximum breadth	Maximum thickness
1	27 mm	25 mm	9 mm
2	30 mm	21 mm	11 mm
3	32 mm	14 mm	12 mm

The average length, breadth and thickness measure 29 mm, 20 mm and 17 mm respectively.

Core: These account for 15.21% of the collection. Specimens have single, double and multiple platforms of flat and oblique types. These are either cylindrical or roughly triangular and few being rectangular. A few specimens indicate primary preparation of the core. The flutings indicate that blades were detached at right angles to each other and were thin and short. The irregular cores with broad shallow flake scars indicate removal of bladish flakes. 80% of the cores found are of chert. Quartz and quartzite cores are very rare.

In summary, the Upper Palaeolithic assemblage of the Malnad region is characterised by blade tools (53%) having working on one or both the margins. The assemblage predominantly consists of simple blades with 39.72% followed by burins accounting for 15%. Next in the order comes scrapers, also with more than 15%, characterised by the dominance of side scrapers. Points form another important category (8%). While groupwise this assemblage shows close affinity to the Shorapur doab, typewise, it could be compared with Chittoor industries.

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Technique· Majority of the artefacts in the collection are made on blades removed from nodules using fluted core technique. After dressing the nodules intially by soft hammers, blades were detached by soft punches through prepared platforms. Numerous blades with flutings and steps or ridges exhibit these features. The blades are then fashioned into various types by using pressure technique to trim the working edge. The blades are thick and exhibit triangular and trapezoidal cross sections. Cores have thin flutings ranging from 3 to 6 in number. Occurrence of a few of Levalloisian flakes displaying prepared core technique indicate continuity from the preceding Middle Palaeolithic phase but in a limited way. Shallow flake scars on both the dorsal and ventral surfaces and prominent bulb of percussion on artefacts suggest the use of stone hammers.

For want of more sites and artefacts, detailed observations on techniques has been restricted. Further work in the region may throw more light on various techniques involved in the preparation of artefcts.

General observations: Occurrence of a solitary site now promising enough of finding more sites in view of the well developed stage represented by this site has helped to bridge the gap between the preceding Middle Palaeolithic and the succeeding Mesolithic cultures in the region under study. In spite of the fact that the tools are found in large quantity, lack of proper stratigraphy makes it rather difficult to put them under a firm time bracket within the Upper Palaeolithic phase. Excepting variations in the frequencies of various tool types, particularly blade and burin group and scraper group, Thakkanahalli assemblage do not seem to differ significantly from those of the north and north-easternly sites of Shorapur doab (Paddayya, 1970), Renigunta (Murthy, 1970), Gunjana valley site (D.R. Raju, 1988) in north Karnataka and south-east Andhra Pradesh respectively.

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The Upper Tungabhadra assemblage is characterised by blade group made on chert. The distinct variations noticed in the material characters is probably owing to the use of even the smallest of chert blades detached from the core. This implies that the crypto-crystelline rock-material was not readily available near the sites as in the case of factory sites elsewhere in the northern Karnataka. It is evident that no source is available in the vicinity and the nearest spot is in the upper reaches, a few kilometres away. This is further corroborated by the fact that 35% of the Upper Palaeolithic artefacts are made on quartz and the entire assemblage of the succeeding Mesolithic is made of similar quartz material which is readily available in the form of pebbles in the river bed.

As already mentioned, the blade group of the Malnad Upper Palaeolithic is closely comparable to the Shorapur doab industry. However, the flake scraper element has no parallel except in Andhra sites. While comparing the Shorapur doab assemblage with that of Rallakalava industry of the Chittoor district which is characterised by blades, backed blades, burins, points and scrapers, Paddayya (1970) opines "The Rallakalava industry and the industry under study compare closely with each other. Since both are based on the production of blade tools and again both belong to the Late Upper Pleistocene/Early part of the sub-recent period and occupy an intermediary position between Middle and Late stone age industries .....". The Nagarjunakonda assemblage comprising blades, burins, scrapers, points and borers have also been compared with Shorapur doab assemblage by him. Taking into consideration the tool types, technique and other features of the present assemblage, it stands broadly in agreement with the Shorapur doab and Renigunta industries and its chronological position does seem to be in conformity with the observations already made above. The assemblage from Thakkanahalli is similar to that of phase II A and II C of Patne in Maharashtra which has a tendency to transform into Mesolithic.

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It is appropriate to note here that phase II D and II E of Patne in fact "reprsent a transition between the Upper Palaeolithic and Mesolithic".

UPPER PALAEOLITHIC TOOL TYPES

Figure I : Blade group

(1)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Black chert Tool type: Simple blade.

Description: Medium sized blade devoid of bulb of percussion and platform. Dorsal surface has flutings and edges. Retouched along the left lateral margin on the dorsal and the right margin on the ventral. Distal end curved and blunted by fluting. Base has also flutings with serrated edge. Measures 3.2 cm x 1.4 cm x 0.5 cm

Comparable to: No. 12, Bhimbetka (Sankalia, 1974 - pp. 225).

(2)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Simple blade

Description: Thick blade, rectangular in form. Deep flake scars, prominent longitudinal mid rib and small patch of cortex near the bottom on the dorsal surface and bulb of percussion on the ventral surface. Margins retouched from dorsal and ventral surfaces. Measures 5.7 cm x 2.9 cm x 1.00 cm.

Comparable to: No. 3, Fig. 24, Shorapur doab (Paddayya, 1970 - pp.174)

(3)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Quartz Tool type: Notched blade

Description: Thick blade, prominent longitudinal mid rib, patch of cortex near the base and flake scars with ridges on the dorsal surface; bulb of percussion and shallow flake scars on the ventral surface. Has prominent notch on the left margin made from dorsal surface. Plain platform. Bottom edge retouched. Measures 7.3 cm x 2.9 cm x 1.5 cm.

Comparable to: No. 7, Fig. 24, Shorapur doab (Paddayya, 1970, pp. 174)

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(4)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Quartzite Tool type: Notched blade

Description: Brownish thick blade. Prominent curved mid rib and shallow scars sloping towards the margin on dorsal surface; diffused bulb of percusison on the ventral surface. Plain platform. Both left and right margins have notches made from dorsal surface. Measures 5.6 cm x 3.3 cm x 1.2 cm.

Comparable to· Variation of Sl. No. 3.

(5)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Pen knife blade

Description: Made on thick blade. Step flaking and patch of cortex on the dorsal surface; cortex retained on the ventral side except upper portion of the flaked left margin. Transverse edge blunted by removing a flake obliquely resulting in beak like projecting sharp tip. Right margin retouched. Deep flake scar on the bottom edge. Measures 3.6 cm x 1.6 cm x 1.00 cm.

Rare type.

(6)

River valley : Upper Tungabhadra Site: Thakknahalli
Rock material: Chert Tool type: Pen knife blade

Description: Made on a bladish flake. Flaking slopes towards the margin and patch of cortex near the distal end on the dorsal surface; numerous shallow flake scars on the ventral surface. Distal end blunted by retouching. Both the margins retouched from dorsal and ventral surfaces. Bottom thick and flat. Measures 2.9 cm x 2.2 cm x 0.80 cm.

Rare type.

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(7)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Quartz (White) Tool type: Backed blade

Description: Made on a medium size blade. Dorsal surface has single flake scar towards left of the working margin. Diffused bulb of percussion on the ventral surface. Thick right margin blunted by removing small flakes in different directions to a crescentic shape. Use marks in the working margin. Measures 4 cm x 1.8 cm x 1.00 cm.

Comparable to: No. 10, Fig. 24, Shorapur doab (Paddayya, 1970, pp.170)

(8)

River valley: Upper Tungabhadra Site: Thakkanahalli
Rock material· Quartz Tool type. Backed blade

Description: Blade with dressed platform. Dorsal surface has a flake scar sloaping towards the left working margin. Prominent bulb of percussion on the ventral surface. Thick right margin blunted to obtain incipient curve. Working margin exhibits use marks. Measures 3.8 cm x 1.4 cm x 0.7 cm.

Comparable to: Variation of No. 7.

Figure II : Burins

(9)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Beaked burin

Description: Made on a thick blade. Series of flutings converging at the distal end and prominent ridge of the dorsal surface. Undulated on the ventral side owing to flaking. The large vertical facet on the right margin intersecting three flutings on the transverse edge producing beak like edge.

Comparable to: No. 17, Fig. 18, Kurnool (M.L.K. Murthy, 1970,pp. 119).

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(10)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Beaked burin

Description: Made on a thin bladish flake. Flutings from the central part slopes towards the margins, small fluting and small spalls removed vertically near the thick distal end on the dorsal side. Vertical spalls have been removed on the ventral surface to achieve beaked projecting working edge. Measures 2.7 cm x 1.5 cm x 0.8 cm.

Comparable to: Variation of Sl. No. 9.

(11)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Single blow burin

Description: Made on a thick flake. Shallow flake scars on the dorsal surface; ventral surface is plain. Right margin straight. Working edge obtained by removing a single vertical spall from the distal end. Thick distal end on the left margin with poited base. Specimen looks like at composite tool. Measures 4.6 cm x 2 cm x 1.00 cm.

Comparable to: No. 25, Fig. 42, Gunjana valley (D.R. Raju, 1988).

(12)

River valley : Upper Tungabhadra Site: Thakkanahalli
Rock material: Chert Tool type: Single blow burin

Description: Made on a thin bladish flake. Small flutings on the dorsal surface. Diffused bulb of percussion on the ventral surface. Right margin retouched on the dorsal side. Working edge obtained by removing a single vertical spall along the left margin at the distal end. Plain platform at the base. Measures 2 cm x 1.4 cm x 0.6 cm.

Comparable to: No. 15, Fig. 18, Kurnool (M.L.K. Murthy, 1970; pp. 119)

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(13)

River valley : Upper Tungabhadra Site· Thakkanahalli
Rock material: Chert Tool type· Bec-de- flute burin
Description: Made on a broad thick blade with slopy platform. Straight longitudinal mid rib and flaked surface sloping towards lateral margins on the dorsal side. Bulb of percussion on the ventral side. Working edge obtained by removing thin spalls obliquely from opposite sides. Measures 3.6 cm x 1.9 cm x 0.8 cm.

Comparable to· No. 15, Fig. 25, Shorapur doab (Paddayya, 1970).

Figure III · Scrapers

(14)

River valley: Upper Tungabhadra Site· Thakkanahalli
Rock material: Chert Tool type· Side scraper
Description: Made on a thick flake roughly rectangular devoid of a platform. Shallow flake scars and patch of cortex on the dorsal side. Diffused bulb of percussion on the ventral side. Convex left working margin retouched both on ventral and dorsal sides. Chipping near the transverse edge. Thick near the base. Flake scars converging at the middle also denote Levallois features. Measures 4.7 cm x 4 cm x 1.5 cm.
Comparable to: No. 1, Fig. 33, Vemula (Timma Reddy, 1970; pp.229).

(15)

River valley : Upper Tungabhadra Site· Thakkanahalli
Rock material: Chert Tool type: Side scraper

Description: Made on a thick flake and roughly triangular in form. Shallow flake scars converging at the middle or dorsal side. Plain ventral surface. Convex left margin retouched on the dorsal side. Prepared platform on the right margin rendering it straight. Bottom rounded off by fluting and chipping. Measures 3.6 cm x 3 cm x 1.5 cm.

Comparable to: No. 2, Fig. 17, Renigunta (M.L.K. Murthy, 1970, pp. 118)

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(16)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type: End scraper

Description: Made on a thick blade, roughly triangular in shape. Series of flutings and steep sides on the dorsal surface. Two flutings and a small patch of cortex retained on the ventral surface. Convex working edge retouched at the distal end from both the surfaces. Irregular thick narrow base. Measures 3.8 cm x 1.7 cm x 1.00 cm.

Comparable to: NO.11, Fig. 3, Patna (S.A. Sali, 1985, pp. 141).

Figure IV : Point group

(17)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type Simple point

Description: Made on a thick blade devoid of platforms. Numerous flutings and prominent mid rib on the dorsal surface. Plain concave ventral surface. Thick narrow base with steep margins. Broad distal end accommodating the tip of the working end retouched on the dorsal side. Traces of working on the right margin from both sides. Measures 3.8 cm x 1.3 cm x 0.90 cm.

Rare type.

(18)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type: Notched point

Description: Made on a thin bladish flake with prepared platform. Shallow flake scars, ridge and patch of cortex retained along the right margin on the dorsal surface. Diffused bulb of percussion on the ventral surface. Base, portion of right and left margins retouched from dorsal surface. Left margin has two notches made from dorsal surface. Bottom notch with shoulder gives the appearence of an incipient tang. The sharp pointed working end attained by converging the margins at the distal end. Measures 2.9 cm x 2.2 cm x 0.6 cm.

Rare type.

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(19)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Bluish opalescent quartz Tool type. Point

Description: Made on a thick blade devoid of platforms. Shallow flake scars and ridges on both the surfaces. Straight and steep left margin. Convex zigzag thin working right margin. Convex working point at the distal end retouched from both the surfaces. Thick butt end blunted by fluting. Measures 6.3 cm x 2.2 cm x 1.5 cm.

Rare type.

(20)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type· Borer

Description· Made on a thick short blade with prepared platform. Prominent mid rib, ridges, fluting and steep sides on the dorsal surface. Slightly concave ventral surface. Ridges are due to natural cleavage of rock. Working tip obtained at the convex distal end by dressing the opposite margins. A small chip removed from the ventral surface below the working tip to strengthen it. Margins retouched on the dorsal surface. Thick butt end. Measures 3.1 cm x 1.2 cm x 0.9 cm.

Rare type.

(21)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type. Core

Description: It is a rough cylindrical core having two broad platforms. Numerous flutings, ridges and a patch of cortex retained on the left margin. Thick at the oblique platforms. Measures 3.4 cm x 1.6 cm x 1.00 cm.

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(22)

River valley : Upper Tungabhadra Site: Thakkanahalli

Rock material: Chert Tool type: Core

Description: Cylindrical in shape with single platform and flutings alround. Short and thin blades removed as is evident from flutings. Measures 2.7 cm x 2.6 cm x 1.6 cm.

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UPPER PALAEOLITHIC TOOL TYPES

Illustrations

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Fig. I : Blade group

Fig. II : Burins

Fig. III : Scrapers

Note : a) Sl.No. of tools mentioned in the description are common to both the drawings as well as plates.

b) Scale of the drawings is drawn to 1 : 1

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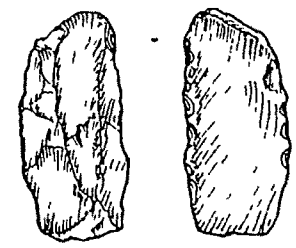
FIGURE I : BLADE GROUP



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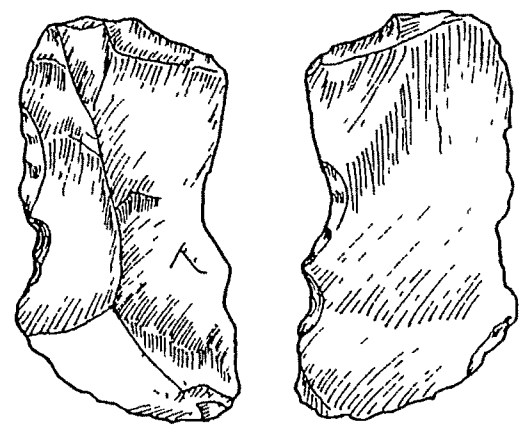

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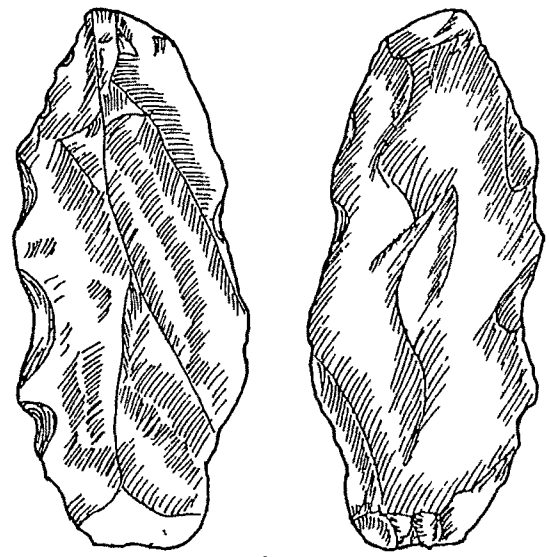

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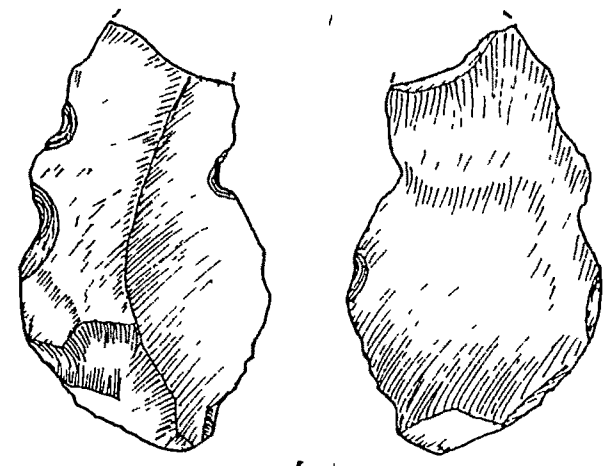

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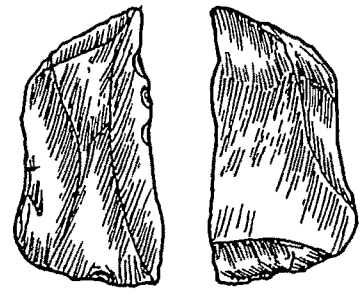

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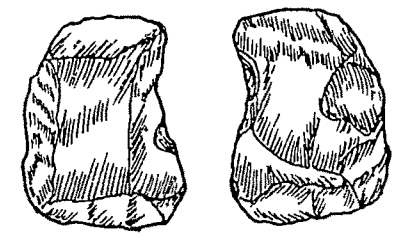

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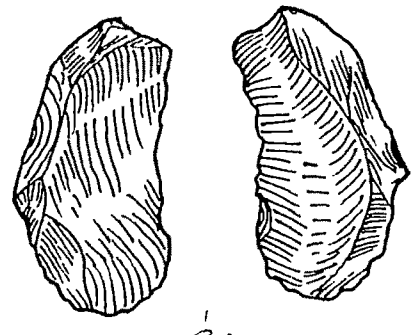

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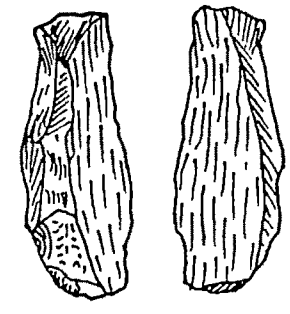

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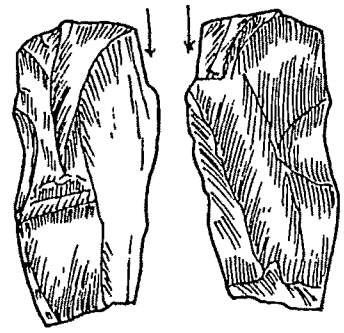
FIGURE II: BURINS



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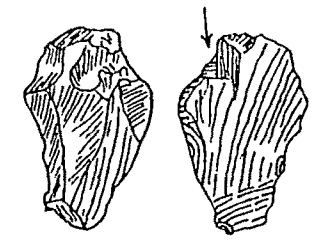

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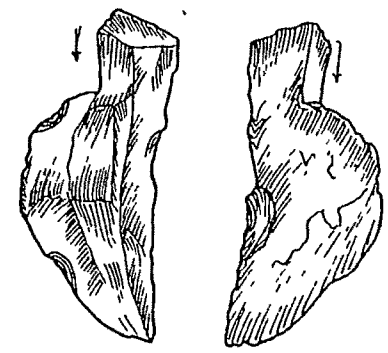

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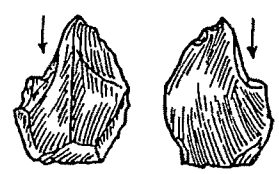

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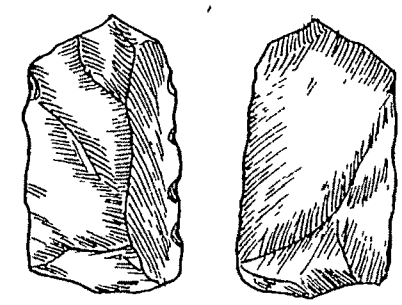

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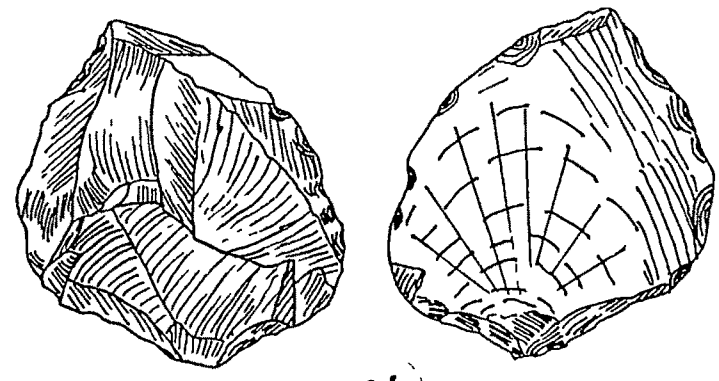
FIGURE III: SCRAPERS



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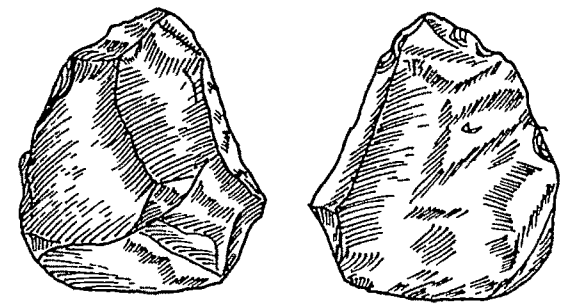

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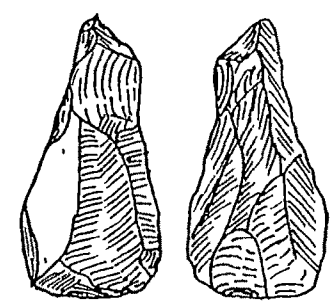

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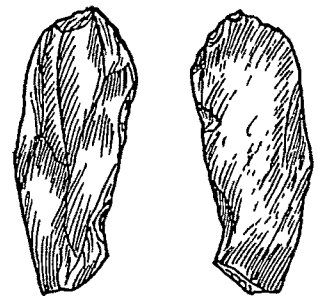
FIGURE IV: POINT GROUP



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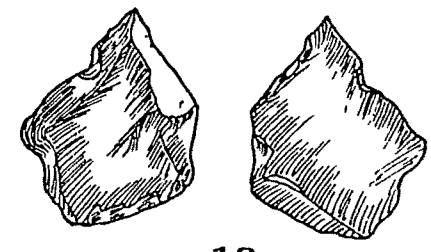

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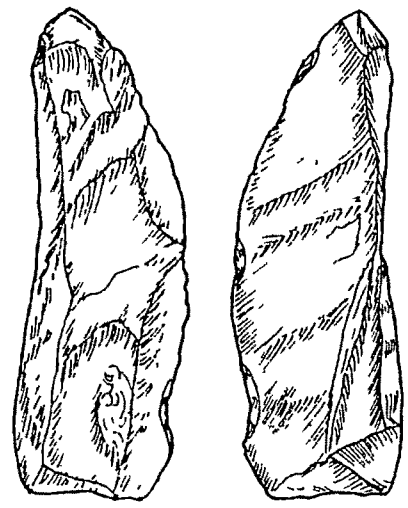

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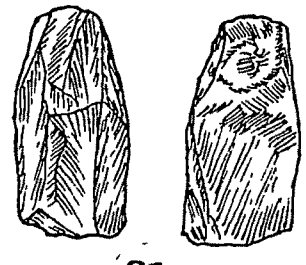

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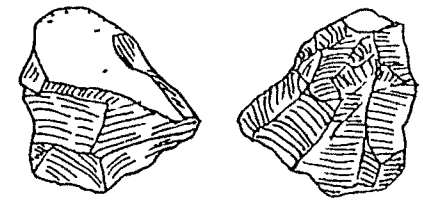

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CHAPTER V

MESOLITHIC SITES

Since the discovery of the first Mesolithic site by A.C.L. Carlleyle as early as in 1867-68 in the rock shelters of the Kaimur range in Uttar Pradesh and Madhya Pradesh (Brown, 1889), much work has been carried out by foreign and Indian Archaeologists resulting in the discovery of numerous Mesolithic sites scattered all over India. Some of the important sites are Pachmarhi (Hunter, 1935-37), Kandivli and Jalahalli (Gordon, 1938), Langhnaj (Sankalia, 1946), Sanganakallu (Subba Rao, 1948), Teri sites (Zuener, 1956), Amrapur (Subba Rao, 1952), Nagarjunakonda (IAR, 1954-60), Kibbanahalli (Seshadri, 1956), Birbhanpur (Lal, 1958), Kuchai (IAR, 1961-62), Morhana pahar (Sharma, 1965), Devnimori (Malik, 1966), sites in the Chittoor district (Murthy, 1970), Bagor (Misra, 1973), Pachad (Joshi & Bopardikar, 1972), Sarai-Nahar-Rai (Sharma, 1973), Patne (Sali, 1985), Bhimbetka (Wakankar, 1976), Adamgarh (Joshi, 1978) and Chopani-Mando (Sharma, 1980).

Sites reported from Shorapur doab (Paddayya, 1970), Upper Krishna basin (Pappu, 1974), South-western Orissa (Tripathi, 1972), Indravati valley (Nanda, 1985), Karanja and Manjra valleys in Bidar district (Shadaksharaiah, 1984), Mallampuzha basin in north-Kerala (Rajendran, 1985) and from Bangalore and Chitradurga districts in Karnataka (IAR, 1975) are also noteworthy. Excavations in a few sites, viz., Langhnaj, Birbhanpur, Bagor, Sarai-Nahar-Rai, Bhimbetka and Adamgarh have revealed striking facts about the people, their food habits, pattern of settlement, pottery and burial practices. Rock shelters in many regions of the country occupied by Mesolithic people are decorated with paintings which tell about the cultural, social and economic aspects of the Mesolithic phase.

Though occurrence of Mesolithic sites were reported as early in 1939 in Karnataka, systematic study of the assemblage was started from 1956 onwards by Seshadri and others. Microliths found in the

Brahmagiri excavations (Wheeler, 1948) were also of not much help to fix a firm stratigraphical horizon of this phase. However, the excavations at Sanganakallu (Sankalia, 1969) indicated the relative chronological horizon of this culture in Karnataka. But excepting tools and their types, no other aspect of the life could be known. Two types of Mesolithic sites were encountered in the earlier explorations. They are (1) sites without pottery and other kinds of cultural relics as for example, Kibbanahalli and Jalahalli; and (2) sites with Neolithic or Chalcolithic pottery, Neoliths, etc., as for example, Brahmagiri, Sanganakallu, Maski, etc. In the case of the latter, it is clearly indicated that the Microliths constituted a part of the lithic tool kit of the Neolithic or Chalcolithic culture and certainly did not represent a seperate Mesolithic cultural stage. Hence, study of the Microliths of this cultural complex would not help in any way in understanding the life of the Mesolithic people. Thus, a few other sites such as Kibbanahalli and Jalahalli alone had to be reviewed time and again for understanding the Mesolithic phase in the Karnataka region. But these sites are not excavated and hence, neither their relative chronology nor their cultural aspect could be ascertained. It is only logically said that these sites might be earlier than the Microliths yielding sites of the type found in Brahmagiri, etc. It is in this context, the excavations at Sanganakallu has been a little more encouraging and valuable. At least the relative chronological horizon could be convincingly established.

So far, 45 Mesolithic sites have been noticed during the survey of various river valleys inthe region under study as detailed below.

	River valley	Total no. of sites
1.	Upper Tungabhadra	22
2.	Bhadra valley	6
3	Tunga valley	9
4	Hemavati valley	8
		45

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These sites are found in different geographical situations, namely:

1. Sites situated in the gravel patches, 3-4 Kms away from the river bank.

2. Sites situated on the terraces of granite outcrops and on the hillocks overlooking the river.

3. Sites situated right on the river bank.

4. Microliths found in the habitation sites yielding Neolithic and Megalithic cultural materials.

While sites of the first three categories are found in the Upper Tungabhadra, the sites of the first two in the Bhadra, of the last two in the Tunga and of the last in the Hemavati valley are found. This point also seems to be noteworthy as it may imply not only the ecological aspect but also the development in the mode of life and increase in the population. The fourth group apparently found in a different situation than the other three groups would be discussed independently. The above sites are dealt with seperately for, the people of these sites seem to have preferred particular geographical localities. Whether this observation is correct can be verified by further study of the lithic tools in all their aspects.

MESOLITHIC: I CATEGORY SITES

THE UPPER TUNGABHADRA VALLEY

Among the Mesolithic sites in the Upper Tungabhadra five sites, viz., Holeharlahalli, Konaikanahalli, Honnali, Harlehalli and Hanagavadi belong to the first category. As already mentioned, these sites are situated 3-4 Km away from the river bank usually located on a slightly elevated gravel patches measuring 80-90 m in circumference and are composed of small to medium size brown skinned pebbles and loose granular sand. The original geo-setting of these sites have been

visibly altered due to heavy and constant agricultural activity over a long period of time. Occurrence of large number of waste flakes, broken pebbles, unfinished nodules and few finished tools indicate that these were factory sites. Waste flakes and tools do not exhibit weathering action and few tools show usage marks. It is interesting to note that except for the difference noticed in the raw material, a few types such as points, scrapers and discoids are typo-technologically similar to the types from the preceding Middle Palaeolithic culture.

Rock material: Quartz pebbles, varying in dimension from small to medium size, abundantly available in the gravel patches in these sites have been used for fashioning artefacts. Pinkish white and grey colours are common.

Environment: These sites fall in the maidan belt of the region dotted with semi-deciduous forest and scrub jungles. Soil colour is reddish in the gravel patches and the surrounding area accommodates brownish soil but devoid of gravel. Most of these sites are near the depressions of folding landscape. Seasonal ponds attracting small animals seem to have been ideal locale for both hunting and for manufaturing tools. The occurrence of gravel patches in these sites may be part of the river terrace. These observations need further study.

Settlement pattern: Whether these people had developed the art of building their dwellings can be known through excavations. The surface evidences do not indicate anything positively in this respect.

The five sites located in the Tungabhadra valley in relation to the distribution pattern of the Lower Palaeolithic sites are found close to one another over a distance of 20 Kms. The distance between two sites being 4-5 Kms on an average. Consequently, they are found in a part of the valley under study. It should be noted here that these microliths are found in grvel patches. Such gravel patches are not traced beyond the area within the sites. Thus, the mode of occurrence of the site appears to be significant.

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Typology: Totally, 260 artefacts were picked from the surface and the sitewise distribution of artefacts is as follows:

Table No. 60

Sitewise distribution of artefacts

Sl. No.	Name of the site	Total No. of artefacts	Total percentage
1	Hole Arlehalli	74	28.46%
2	Konaikanahalli	53	20.38%
3	Honnali	54	20.76%
4	Harlehalli	21	8.10%
5	Hanagavadi	58	22.30%
		260	100.00%

Sitewise typological distribution of artefacts of first category from Upper Tungabhadra is given in the table below.

Table No. 61

Common tool types of 1st category - Upper Tungabhadra

Sl. No.	Tools	Hole - Arlehalli	Konaikana-halli	Honnali	Harle-halli	Hanaga-vadi	Total
1	2	3	4	5	6	7	8
1	Hollow scraper	2	1	-	2	1	6
2	Side scraper (single)	6	4	4	2	11	27
3	Side scraper (double)	11	-	7	3	3	24
4	Side end scraper	4	9	-	8	3	16
5	End scraper	-	1	2	1	-	4
6	Cortexed scraper	-	3	4	-	2	9
7	Thumb nail scraper	-	-	1	-	-	1
8	Round scraper	-	-	-	1	-	1

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1	2	3	4	5	6	7	8
9	Core scraper	2	-	-	1	5	8
10	'D' type scraper	-	-	-	-	3	3
11	Borer	3	-	3	-	1	7
12	Awl	-	2	2	-	1	5
13	Discoid	-	2	2	-	1	5
14	Burin	1	-	-	-	1	2
15	Harpoon	-	1	-	-	-	1
16	Scraper cum point	4	2	-	1	-	7
17	Assymetric point	4	5	-	-	5	14
18	Symmetrical point (with prepared platform)	6	6	9	-	5	26
19	Tanged point	1	1	-	-	1	3
20	Double sided point	-	-	-	-	3	3
21	Core point	2	-	-	-	1	3
22	Core	9	6	5	1	3	24
	Blades						
23	Retouched blade	8	-	2	2	4	16
24	Unretouched blade	-	5	2* 7®	1	4	19
25	Backed blade	2	3	2	1	-	8
26	Points on blades (assymmetric)	8	3	4	3 & 2	-	20

*Single side .. 7
®Double side .. 2

A cursory glance at the table indicates two main groups, namely, flake and blade groups, accounting for 66.52% and 33.48% respectively. Varieties of scrapers and points dominate the flake group while the blade group is dominated by unretouched blades. Other noteworthy tool types include borer, awl and discoids. Fluted cores also form a major chunk of the collection.

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Flake group: As already mentioned, scrapers dominate this group followed by points. The main features of both the groups and their sub-types are described below.

Scraper: scrapers form 42.68% of the flake group collection. Artefacts are made on thick flakes of varying forms invariably thick at the centre. A small percentage (3.01%) of scrapers made on cores are also available in the collection. Shallow flaking on both the surfaces and cortex retained in some on the dorsal side. Retouching is done along the working margin either on one side or on both the sides. Size of scrapers vary from site to site. Scrapers have been classified on the basis of forms and described below sub-typewise.

Side scraper: This category comprises of artefacts with working on one or both the sides accounting for 19.63% of the total collection. These are made on thick amorphous flakes. Double sided scrapers are worked on both the margins and invariably have two or more faceted platforms. Secondary retouch of the margin is limited to few specimens and in few alternate flaking is prominent. In single sided scrapers, left margin is retouched while the right lateral side is slightly curved/blunted by removing shallow flakes probably to accommodate firm grip while in use. Facated platforms are also visible. Specimens of both the groups are thick at the centre. Cortexed upper surface is retained in couple of them. Bulb of percussion is found nipped in most of the specimens.

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Metrical analysis of scrapers

(a) Length range:

Sl. No.	Measurement range	Total	Percentage
1	10 mm to 20 mm	3	6%
2	20 mm to 30 mm	22	44%
3	30 mm to 40 mm	12	24%
4	40 mm to 50 mm	11	22%
5	50 mm to 60 mm	2	4%

(b) Breadth range:

Sl. No.	Measurement range	Total	Percentage
1	10 mm to 20 mm	12	24%
2	20 mm to 30 mm	27	54%
3	30 mm to 40 mm	8	16%
4	40 mm to 50 mm	3	6%

(c) Thickness range

Sl. No.	Measurement range	Total	Percentage
1	1 mm to 10 mm	16	32%
2	10 mm to 20 mm	30	60%
3	20 mm to 30 mm	4	8%

Lengthwise, scrapers belong to five groups and vary between 10 mm to 60 mm. The maximum and minimum length measure 55 mm and 19 mm respectively. Specimens ranging between 20 mm to 30 mm dominate and account for 44% of the total collection in this category.

Breadthwise, scrapers belong to four groups and range between 10 mm and 50 mm. Specimens ranging between 20 mm and 30 mm is the most dominating with 54% followed by the group ranging between 10 mm to 20 mm respectively.

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Thicknesswise, some uniformity is observed in the specimens. The measurement vary between 1 mm and 30 mm and the group ranging between 10-20 mm shows high frequency of 60% folowed by specimens ranging between 1 mm and 10 mm accounting for 32% of the total collection in this category.

Side end scraper: Side end scrapers made on thick flakes form 6.16% of the total collection. These are roughly 'U' shaped with working edge on both the shorter sides as well as the distal end. Shallow flake scars are visible on both the surfaces. Rough and thin working end achieved by alternate flaking exhibits limited retouching. Straight end, thick at the bottom with one of the specimens exhibiting flat surface on the dorsal side is probably to accommodate firm hold at the time of working. Steep flaking towards upper end also gives it the appearance of crude transverse arrow head. Since these shapes are unusual, these have not been included in the side scraper group.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10 mm to 20 mm	2	12.50%	10 mm to 20 mm	1	12.50%	1 mm to 10 mm	2	12.50%
2	20 mm to 30 mm	1	6.25%	20 mm to 30 mm	10	62.50%	10 mm to 20 mm	12	75.00%
3	30 mm to 40 mm	9	56.25%	30 mm to 40 mm	4	25.00%	20 mm to 30 mm	2	12.50%
4	40 mm to 50 mm & above	4	25%						
			100.00%			100.00%			100.00%

The length of the side end scraper may vary between 10 mm and 60 mm. the maximum and minimum length being 57 mm and 18 mm respectively. 56.25% specimens fall between 30 to 40 mm, while 25% of them range

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between 40 to 50 mm. Breadthwise, specimens ranging between 20 mm to 30 mm account for 62.50% while those between 30 to 40 mm range account for 25%. Thickness of specimens vary between 9 mm to 22 mm. Those ranging between 10-20 mm show a high frequency of 75%.

Hallow scraper: This category is represented by only six specimens and constitutes 2.31% of the total collection. These are made on elongated thick flakes. One specimen made on a thin flake is also noteworthy. All have prominent medial ridge. Retocuhed working edges are noticed on the left lateral margin in four artefacts while the remaining two have it on the right lateral margin.

Metrical analysis: The smallest of the specimens measures 15x16x7 mm while the biggest one measures 53x23x14 mm. Lengthwise, the specimens range between 15 mm and 53 mm of which 33.3% of the specimens range between 40 mm and 50 mm and above. Breadthwise, they range between 16 mm and 33 mm of which 6.6% range between 20 mm and 30 mm. Thicknesswise, artefacts ranging between 10 mm and 20 mm account for 62.5%.

Round scraper: The lone specimen of this group account for 0.38% of the total collection. Shallow flake scars on both the surfaces and irregular working end alround. The maximum length, breadth and thickness measure 55 mm, 49 mm and 23 mm rspectively.

End scraper: End scrapers constitute 1.54% of the total collection. These are made on thick flakes. Flaked and convex shorter sides are used as working end. On an average, lengthwise, these measure between 24 mm and 33 mm and thicknesswise, these measure between 12 mm and 21 mm.

Thumb nail scraper: One specimen of this type is available in the collection accounting for 0.38% of the total collection. Steep flaking is noticeable on one side to achieve working end. The working edge is slightly retocuhed. The flat surface on one side is deliberately

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achieved for thumb use. the maximum length, breadth and thickness measure 33 mm, 26 mm and 16 mm respectively.

Semi-circular scraper: This group comprises of three specimens forming 1.16% of the total collection. These specimens have close similarity to the side scrapers. The straight working edge is poorly fashioned and devoid of retouch. The curved non-working edge is poorly fashioned and devoid of retouch. The curved non-working side gives the appearance of 'D' shape.

Cortexed side scraper: This group forms 3.47% of the total collection. Typologically, this should be discussed under side scraper group. As the name denotes, cortex is retained on one side and the detached surface below is plain. Secondary retouch is done in small patches along the working end on one side. There is no uniformity in shape.

Metrical analysis: Length of cortexed side scrapers vary between 18 mm and 46 mm. The most dominating group of specimens ranging between 30 mm and 40 mm accounting for 44.4% while those ranging between 20 mm and 30 mm account for 33.3%.

The minimum and maximum breadth of the specimens are 15 mm and 33 mm respectively. Specimens ranging between 10 mm and 20 mm account for 44.4% closely followed by specimens ranging between 20 mm and 30 mm which account for 33.3%.

Specimens ranging between 10 mm and 20 mm in thickness acount for 88.8%.

Core scraper: These constitute 3.01% of the total collection. Generally irregular in shape. Zigzag working edge due to employment of alternate flaking. Elongated fluting scars are noticeable. Cortex is retained in one of the specimens.

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Metrical analysis: Minimum and maximum length of core scrapers measure 21 mm and 35 mm respectively. Specimens ranging between 20 mm and 30 mm account for 62.5% while those ranging between 30 mm and 40 mm account for 37.5%.

Breadthwise, specimens ranging between 20 mm and 30 mm account for 75% and those ranging between 30 mm and 40 mm account for 25%. Maximum and minimum breadth of specimens measure 32 and 21 mm respectively. Thicknesswise, specimens ranging between 10 mm and 20 mm account for 62.5%.

Point· Points with different shapes account for 18.8% of the total collection. These are made on flakes detached from pebbles of small to medium size. Symmetrical and tanged points are made on thick flakes, whereas assymmetrical points are made on thin flakes. Cortex is retained near the base in a few symmetrical points and are bifacially worked. These appear like arrow heads. Points are attained by removing flakes obliquely in assymmetric group. A small percentage of points are made on cores. Sub types, their features and analysis are discussed below.

Symmetrical point: These are triangular or leaf shaped made on quartz and account for 55.1% of the total collection of point group. These are bifacially worked and fabricated on flakes, usually thick at the centre. In some specimens, base is flat. Cortex is retained at the base in a few points. Pointed tip is attained either by producing notch on both sides or by removing flakes obliquely from both the sides near the top. Secondary retouch of the margins is noticeable. Thick in section, broad and short on plan. This is a rare variety and noteworthy. In fact, these specimens in their shape, workmanship, etc., have close similarity to the bifacial point group of the Teri sites (Zeuner, 1949) in Tirunelveli district of Tamilnadu.

Metrical analysis

Sl. No.	Length range	Total No.	Perce-ntage	Breadth range	Total No.	Perce-ntage	Thickness range	Total No.	Percen-tage
1	20-30 mm	3	12%	10-20 mm	1	4%	1-10 mm	2	8%
2	30-40 mm	20	80%	20-30 mm	16	64%	10-20 mm	23	92%
3	40-50 mm	2	8%	30-40 mm	8	32%			

Maximum and minimum length of the specimens measure 44 mm and 25 mm respectively. Specimens ranging between 30 mm and 44 mm show high frequency of 80%.

Breadthwise, specimens ranging between 20 mm and 30 mm account for 64% while those ranging between 30 mm and 40 mm account for 32%. The maximum and minimum breadth measure 38 mm and 14 mm rspectively.

Thicknesswise, there seems to be uniformity as 92% of the specimens range between 10 mm and 20 mm.

Assymmetric point: These are made on irregular flakes, thin in section and account for 5.39% of the total collection. The margins are not symmetric and the point is achieved by trimming the tip or by removing a flake obliquely near the distal end.

Metrical analysis

Sl. No.	Length range	Total No.	Perce-ntage	Breadth range	Total No.	Perce-ntage	Thickness range	Total No.	Percen-tage
1	10-20 mm	1	7%	10-20 mm	7	50%	1-10 mm	8	57.2%
2	20-30 mm	10	71.4%	20-30 mm	7	50%	10-20 mm	6	42.8%
3	30-40 mm	4	21.4%						

Length of assymmetric point vary between 16 mm and 40 mm. Specimens ranging between 20 mm and 30 mm account for 71.4% followed by specimens ranging between 30 mm and 40 mm with 21.4%.

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Thicknesswise, specimens ranging between 1 to 10 mm show high frequency with 57.2% closely followed by specimens ranging between 10-20 mm with 42.8%.

Tanged point: These account for 1.16% of the total collection. There are in all three specimens made on thick flakes. Konaikanahalli specimen has a pronounced tang while the remaining two specimens have incipient tangs. Crude workmanship is probably due to the use of quartz. Usually, the dorsal side has central ridge and the tang is produced by two deep notches on either side of margins near the base. Pronounced tang in one of the specimens is a clear indication of use of hafting.

Apparently, these are heavy and have no similarity in measurements. Since the specimens are limited maximum measurements of these have been given.

Sl. No.	Site	Length	Breadth	Thickness
1.	Konaikanahalli	74 mm	43 mm	37 mm
2.	Hole Arlehalli	46 mm	32 mm	20 mm
3	Hanagavadi	49 mm	34 mm	22 mm

Double sided point: These are made on thin flakes having working points at both the ends achieved by removing flakes obliquely from the side margins near the ends. Retouching is absent. These constitute 1.16% of the total collection. Average length, breadth and thickness of specimens measure 48 mm, 20 mm and 12 mm respectively.

Core points: These account for 1.16% of the total collection. Cylindrical cores have been used to attain desired point by working the margins. Actual use can not be ascertained. In one specimen, cortex is retained. Fluted scars are prominent in the remaining specimens. Tip is slightly curved and the base is flat. Maximum length, breadth and thickness measure 42 mm, 42 mm and 21 mm respectively.

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Serrated point: It is an interesting specimen in the collection and account for 0.38% of the total collection. It is made on a thick flake with two deep notches producing serrated points, on one side of the margins. The other margin is straight and slightly curved near the top apparently, the tool appears like a harpoon. It is made on quartz and measures 37 mm x 20 mm x 12 mm.

Borer: These are made on thick flakes of quartz and account for 2.70% of the total collection. The working point is achieved by producing notches at the distal end or in the middle of the side margins and then, the point is slightly retouched. In one specimen, portion of a pebble core is used. Specimens are pressure flaked all over.

Metrical analysis: Maximum and minimum length of specimens measure 64 mm and 22 mm respectively. Specimens ranging between 40 mm and 50 mm are dominating with 42.8%.

Breadthwise, specimens belonging to 20 mm and 30 mm show high frequency with 85.7%. The breadth of specimens vary between 18 mm and 32 mm.

Thicknesswise, specimens between 10 mm and 20 mm range account for 71.4% and they vary between 9 mm and 25 mm respectively.

Scraper-cum-point: These are made on both thick and thin irregular flakes of quartz and account for 2.70% of the total collection. Working end is achieved by producing notch on either side and by removing flakes at oblique angle. Margins are retained. In one specimen, cortex is retained on dorsal side. Another specimen is cylindrical in shape and concave at the middle.

Metrical analysis: Length of specimens vary between 31 mm and 58 mm. Those ranging between 40 mm and 60 mm show high frequency of 57%.

Maximum and minimum breadth of specimens measure 54 mm and 18 mm respectively. Specimens ranging between 10 mm and 30 mm show frequency with 57%.

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Thickness of specimens range between 8 mm and 20 mm. 85.7% of the specimens fall between the range of 10 mm and 20 mm.

Discoid: These are oval or round shaped, made on thick flakes of quartz and account for 1.93% of the total collection. Shallow step flake scars on the upper surface is prominent. Working edges are thin and zigzag. Although actual use is not known, they might have been used for scraping. Maximum and minimum length, breadth and thickness are as follows:

	Length	Breadth	Thickness
Maximum	60 mm	53 mm	34 mm
Minimum	42 mm	31 mm	18 mm

Burin: Two specimens made on quartz have been collected one each from Hole Arlehalli and Hanagavadi. One is made on a flake and the other on a fluted core. Burin facet is achieved by striking a blow at the ventral side along the left margin. The average length, breadth and thickness measure 24 mm, 11 mm and 10 mm respectively.

Awl: The lone specimen made on milky quartz is from Konaikanahalli. It is made on a thick flake. Working end is achieved at the middle of the left margin by producing two shallow notches. The maximum length, breadth and thickness measure 30 mm, 21 mm and 18 mm respectively.

Blade group: Blades or bladish flakes have been used for various purposes in the Mesolithic period and they constitute one of the important groups. Artefacts of this group in the present collection account for 24.2% of the total collection. Depending on the shape and retouch done, these have been classified into four groups. A cursory glance at these specimens indicates that short and broad blades dominate the collection. This is mainly due to the use of quartz as raw material. Pressure technique and soft hammer technique have been employed to detach blades and to attain working ends. Totally, 63 specimens picked up from five sites have been classifed under different groups and discussed seperately.

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Retouched blade: These constitute 25.39% of the blade group collection. These blades made on quartz might have been used independently or as composite tools to cut organic materials. The blades show marks of retouch on one or both the margins. A few are parallel sided. The usage marks are difficult to distinguish. Majority of specimens are irregular, short and broad.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	7	43.75%	10-20 mm	14	87.50%	1-10 mm	12	75%
2	20-30 mm	6	37.50%	20-30 mm	2	12.50%	10-20 mm	4	25%
3	30-40 mm	3	18.75%						
		16	100%		16	100%		16	100%

Length of specimens vary from 14 mm to 35 mm. Those ranging between 10 mm and 20 mm show high frequency with 43.75%. Breadthwise, specimens ranging between 10 mm and 14 mm account for 87.50%. Thicknesswise, specimens ranging between 1 to 10 mm account for 75%.

Unretouched blade: These simple blades made on quartz are devoid of use marks and account for 30.15% of the blade group collection. These are small and medium sized having prominent medial ridge on the dorsal side. Numerous flutings are noteworthy.

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Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	7	36.84%	10-20 mm	12	63.15%	1-10 mm	12	63.15%
2	20-30 mm	7	36.84%	20-30 mm	7	36.84%	10-20 mm	7	36.84%
3	30-40 mm	5	26.31%						

The maximum and minimum length of specimens measure 40 mm and 17 mm respectively. Specimens ranging between 10-20 mm and 20-30 mm show equal proportion of 36.84%. In breadth, specimens ranging between 10-20 mm account for 63.15%. Thickness of specimens vary from 5 mm to 15 mm and artefacts ranging between 1-10 mm account for 63.15%.

Backed blade: Backed blades might have been used as composite tools and the deliberate backing indicates use of haft. These are made on short broad blades of quartz and account for 11.11% of the blade group. Working edge is straight and has usage marks. Back is attained by blunting the other margin in a roughly semi-circular shape. The maximum and minimum length, breadth and thickness are as follows·

Maximum: 34 mm x 24 mm x 10 mm
Minimum: 23 mm x 17 mm x 7 mm

Technique: In the first category are numerous types made on core, flake and blades. The techniques employed in the manufacturing of tools, namely, (a) stone hammer and soft hammer techniques exhibit continuance of techniques from preceding Middle Palaeolithic and (b) use of pressure flaking technique which had not been used in the preceding cultures, are noteworthy. Although percentage of Levallois flake is small, it shows the continuance of prepared core technique also. The blades have been removed from short cores through punch technique as is evident from the size of blades and the flutings on the cores. The working edge and the blunted sides of the specimens with minute low

angle retouching and small shallow flake scars exhibit controlled flaking.

General observations: In particular, what is really noteworthy is the distribution pattern of the sites in relation to those of the Lower and Middle Palaeolithic sites. The sites are concentrated in a limited area. The lithic tools are found only in the gravel patch. But, it should be noted that there might be more gravel beds exposed containing similar lithic tools. But as mentioned above, the surface features over a large area in the valley is very much altered owing to constant cultivation. Hence, the distribution pattern as known today can not be taken to be the same in the past. Therefore, more intensive work is necessary from this point of view. The occurrence of tools in the gravel patches only is significant for the environmental condition indicated by the gravel patch are evidently different from that of the period characterised by the formation of the overlying soil.

Select specimens are described seperately.

MESOLITHIC - II CATEGORY SITES - THE UPPER TUNGABHADRA

In this group are three sites viz., Haraganahalli, Salabalu and Surahonne.

Environment: The sites are situated in the maidan belt of the region with vast open land and scrub jungles. Although the area receives less rain fall, tools found embedded in the reddish fine soil over the granitic hillocks is noteworthy.

Rock material: Majority of implements are made on whitish quartz. Intrusive quartz veins amdist the granite outcrops seems to be the main source. Besides, small pebbles have also been used for fashioning tools as is evident from the cortexed implements in the collection. One scraper made on chalcedony is noteworthy. Brownish quartzite lumps and flakes are sparsely used.

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Typology: Totally seventy artefacts were picked up from the surface of three sites as noted below.

Sl. No.	Site	Total Nos.	Percentage
1	Haraganahalli	19	27.20%
2	Salabalu	21	30.00%
3	Surahonne	30	42.80
	Total	70	100.00%

The following types shown in the table could be picked up from the sites.

Table No. 62

Typewise distribution of artefacts

Sl.No.	Tool type	Total No.	Percentage
1	Side scraper	25	35.72%
2	Side end scraper	7	10.00%
3	Round scraper	1	1.43%
4	Hollow scraper	2	2.85
5	Assymmetric point	12	17.14%
6	Symmetric point	3	4.28%
7	Scraper cum point	1	1.43%
8	Transverse arrow head	1	1.43%
9	Blade	11	15.73%
10	Fluted core	2	2.85%
11	Simple core	5	7.14%
	Total ...	70	00.00%

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The flake group with varied types as in 1st category dominates while the blade group is composed of unretouched ordinary blades.

A brief account of flake group and blade group is given below along with analysis of each type and their characteristic features.

Flake group: 75.71% of the assemblage are made on flakes, the maximum and minimum length being 47 mm and 14 mm respectively. Types in this group include scrapers with sub types, points, transverse arrow head, etc.

Side scrapers: Scrapers worked on single side dominate. A few exhibit working on both the sides and secondary retouch. Zigzag working end exhibits alternate flaking. Flutings, cortexed surface and plain platform are some of the noticeable features. While the Haraganahalli side scrapers are larger in size, those picked up from Salabalu and Surahonne are worked on smaller flakes and differ in thickness also.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	2	8%	10-20 mm	12	48%	1-10 mm	11	44%
2	20-30 mm	18	72%	20-30 mm	9	36%	10-20 mm	12	48%
3	30-40 mm	1	4%	30-40 mm	3	12%	20-30 mm	2	8%
4	40-50 mm	4	16%	40-50 mm	1	4%			
		25	100%		25	100%		25	100%

The length of scrapers varies from 14 mm to 47 mm. Specimens ranging between 20 mm and 30 mm dominate and account for 72% of the collection in this category.

Breadthwise, specimens ranging between 10 mm-20 mm dominate with 48%, closely followed by the group ranging between 20 mm-30 mm with 36%.

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Thickness of specimens varies between 7 mm and 21 mm. Specimens ranging between 10 mm-20 mm dominate with 48% and those ranging between 1 mm-10 mm account for 44% of the collection.

Side scraper: These form 10% of the total assemblage and are made on short thick flakes. The proximal end is invariably straight and flat while the shorter sides and distal end are worked. Faint secondary retouching, shallow flaking of both the surfaces are noteworthy. A few are thick at the centre. One of the specimens exhibits pebble cortex. Haraganahalli tools are comparatively bigger in size than the specimens picked up from other two sites. Except one specimen which is 'U' shaped, others are of different shapes.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-30 mm	4	57.2%	10-20 mm	1	14.2%	10-20 mm	4	57.2%
2	30-40 mm	3	42.8%	20-30 mm	6	85.8%	20-30 mm	3	42.8%
			100%			100%			100%

The specimens ranging between 20 mm - 30 mm dominate and account for maximum percentage of the total collection under this category.

Round scraper: This lone specimen picked up from Surahonne accounts for 1.43% of the total collection. It has shallow flake scars on the dorsal side while the ventral surface is flat and devoid of working. The working edge is zigzag alround and the tiny scars indicate pressure flaking. It is thick at the centre and measures 19 mm x 11 mm x 9 mm.

Hollow scraper: Made on thick flakes of quartz, the hollow scrapers account for 2.85% of the total collection. One is cylindrical in shape with four fluting marks and obliquely cut base. The curved right side margin is retouched and slightly pointed at the distal end. The second specimen has flat base and the upper portion is worked all over. The

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zigzag margin running alround devoid of retouch seems to has been used as working edge. The maximum length, breadth and thickness measure 26 mm x 15 mm x 15 mm respectively.

Point: These form the second largest type after scrapers accounting for 28.3% in the flake group and constitute 21.42% of the total collection. On the basis of shape, two groups are distinguished viz., assymmetric and symmetric. Symmetrical points are comparatively large and the rest are small and amorphous. Few triangular shapes are noteworthy. The size of tools of both the groups differ considerably from similar types of the first category. Features of sub types are described below.

Assymmetric point: Made on thick short flakes; retouched working margins, faceted platforms and nipped bulb of percussion in them are noteworthy. These constitute 17.14% of the total collection. Working end is achieved by producing notches near the distal end and is further strengthened by removing thin flakes from below the surface, is also noteworthy.

Metrical analysis

Sl. No.	Length range	Total No	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	3	25%	10-20 mm	9	75%	1-10 mm	8	66.66%
2	20-30 mm	9	75%	20-30 mm	3	25%	10-20 mm	4	33.33%

The length of points varies from 10 mm to 30 mm. The maximum and minimum length measure 29 mm and 18 mm respectively. Specimens ranging between 20 mm-30 mm dominate with 75%.

Breadthwise, maximum and minimum measurement of specimens are 26 mm and 14 mm respectively. Specimens ranging between 10 mm to 20 mm show high frequency with 75%.

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Specimens ranging between 1 to 10 mm in thickness account for 66.66% of the collection. The maximum and minimum thickness measure 16 mm x 5 mm respectively.

Symmetrical points: These constitute 4.28% of the total collection. These are fabricated on small flakes. These are short and broad on plan and thin in section. The side margins are retouched in a fashion to converge at the distal end. Numerous shallow flake scars on the dorsal surface is significant and the ventral surface is plain. These points are different both in size and type than their counterparts in the first category. Their complete absence from Haraganahalli and their small representation in the total collection of tools from second category site is particularly noteworthy. The average length, breadth and thickness measure 18.6 mm, 13 mm and 7.3 mm respectively.

Scraper cum point: The lone specimen of this type from Haraganahalli accounts for 1.43% of the total collection. Made on a thick greyish quartz flake, it is triangular in shape. Worked side margins and point are obtained by flaking the left side margin obliquely. Rough retouching on both the sides. Flat and thick base. This type is completely absent at both Surahonne and Salabalu sites. The length, breadth and thickness measure 49 mm, 36 mm and 19 mm respectively.

Transverse arrow head: This is made on a thin quartz flake accounting for 1.43% of the collection. It is thin in section and almost semi-circular in plan. Its shorter sides are worked and has a short projection looking like a tang. The thin working edge is attained by removing flake at acute angle. Its presence also indicates use of geometric tools. The length, breadth and thickness measure 21 mm, 17 mm and 5 mm respectively.

Blade group: This group accounts for 15.73% of the total collection. These are simple parallel sided and single sided short blades devoid of retouch. Fluting on one or both the sides indicates pressure technique. Working edges are thin and sharp and some have use marks.

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The actual use though not known, it is postulated that these were used for cutting either as individual tools or as composite ones. These are obtained from Salabalu and Surahonne. Their absence in Haraganahalli is noteworthy.

Metrical analysis

Sl. No.	Length range	Total NO.	Perce-ntage	Breadth range	Total No.	Perce-ntage	Thickness range	Total No.	Percen-tage
1	10-20 mm	7	63.63%	1-10 mm	2	18.18%	1-10 mm	9	81.81%
2	20-30 mm	4	36.36%	10-20 mm	9	81.81%	10-20 mm	2	18.18%
			99.99%			99.99%			99.99%

Variartion between length, breadth and thickness is almost uniform. The average length, breadth and thickness measure 19.6 mm, 14.09 mm and 8.5 mm respectively.

Fluted core: These account for 2.85% of the total collection. These exhibit flutings measuring 33 mm in length and 11 mm in breadth. However, these measurements vary probably due to the use of quartz usually not susceptible for obtaining ribbon like blades. Flutings also indicate pressure technique. Cores have platforms and pointed end almost cylindrical in shape. The average length, breadth and thickness measure 32 mm, 24.5 mm and 16 mm respectively.

Simple core: These are simple cores (7.14%) showing variety of flake scars on both the surfaces. Flake scars are usually broad and shallow. Stone hammer technique seems to have been used to detach flakes from the cores of different shapes. Maximum length and thickness of cores measure 84 mm and 40 mm respectively.

Technique: The assemblage mainly comprises of flake tools. Percentage of blades and cores are comparatively low. Majority of the flake tools are devoid of positive bulbs. However, one or two specimens with

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diffused bulb indicate use of soft hammer technique. Numerous fluted marks on the flakes, blades and the blunting and retouching done in them perhaps indicate pressure technique. Similar technique is noticed in the first category sites also.

General observations: The assemblage from sites of second category on the slopes of granitic hillocks are characterised by flake tools, such as scrapers, points, end scrapers, etc. Blade group is represented by ordinary blades without retouch. The collection is almost non-geometric. The flake tools especially the scrapers appear to be rather big, in comparison with those from other sites. Tools are mostly prepared on quartz of varying colours. Limited use of quartzite and chalcedony is noteworthy.

Tool types are comparatively less than in the first category. Scrapers and points are dominating groups. Bifacially worked points observed in the first category sites are absent here. There are three symmetrical points with worked side margins on one side while the other side is flat and plain. Lone transverse arrow head with a tang perhaps indicates hafting. Blades are either parallel sided or single sided. There is no working on the margins. They are flat and broad with a curved or pointed tip.

An interesting feature that deserves attention is the tendency to occupy small hillocks with granitic outcrops situated fairly away from the river bank. Select specimens are described seperately.

MESOLITHIC-III CATEGORY SITES -

THE UPPER TUNGABHADRA VALLEY

In the Upper Tungabhadra valley, three sites belonging to this category have been located. While sites at Chikbasur and Sasivehalli are situated right on the river bank, the site at Nyamti is found situated on the slopes of the bank of Hirehalla, a small tributary of Tungabhadra.

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Environment: The sites under investigation are open sites situated on the maidan belt of the region. The surroundings of the sites are usually occupied by small bushes and the colour of the soil is brown.

Rock materials: As already seen in the sites of the above two categories, here too, quartz has been profusely used. Other rock materials used include rock crystal, quartzite and banded agate. The tool assemblage mostly looks fresh probably indicating their local manufacture. Microliths are found scattered along with few rejects.

Typology: Totally, 151 tools and a large number of waste flakes were collected from the three sites under reference. The following table indicates the sitewise distribution and their percentage.

Table No. 63

Distribution of artefacts

Sl. No.	Site	River/Stream	No. of objects	Percentage
1	Chikbasur	Upper Tungabhadra	37	24.50%
2	Sasivehalli	-do-	35	23.18%
3	Nyamti	Hirehalla	79	52.32%
		Total ...	151	100.00%

The above table indicates that two sites located in the main river valley have yielded 72 specimens accounting for 47.60%. Similarly, the lone site near a stream accounts for 79 specimens with 52.32%. The assemblage comprises of tools on flake and blade having different sub-groups such as scrapers, points, backed blades, retouched blades, etc. Though the assemblage is dominated by non-geometric group, few geometric tools are also present in the collection.

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The tools assemblage could be placed under flake-blade group and are classified as per shape, technique, etc., unlike the tools of the first and second categories; in these tools, uniformity in shape, technique and size could be noticed. Workmanship seems to be more refined in these specimens. The following table presents the classification of tool types and their percentage.

Table No. 64

Typological distribution of artefacts

Sl. No.	Tool type	Total No.	Percentage
1	Side scraper	25	16.56%
2	End scraper	5	3.32%
3	Hollow scraper	2	1.32%
4	Round scraper	3	1.98%
5	Assymmetric point	27	17.88%
6	Symmetric point	7	4.64%
7	Tanged point	3	1.98%
8	Scraper cum point	2	1.32%
9	Borer	3	1.98%
10	Lunate	12	7.95%
11	Simple blade	14	9.28%
12	Retouched blade	23	15.24%
13	Backed blade	9	5.97%
14	Points on blade	13	8.60%
15	Cores	3	1.98%
	Total ...	151	100.00%

It is clear from the above table that in typology and in pattern of distribution, close similarity is descernible between sites. Tools made on flakes account for about 60% of the total collection and blade

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group with their sub groups and their percentage along with analysis of length, breadth and thickness of each group is discussed below.

Flake group: Scrapers and points dominate this group with 23.18% and 24.50% respectively. Flakes used for fashioning tools are comparatively smaller in size to the similar types from the two categories discussed earlier. The other types of this group include scraper cum point and borers. Bladish flakes have been used for fashioning geometric types such as lunate and trapezoids. Typewise analysis of flake group is discussed below.

Scraper: This constitutes a major portion of the collection with 23.18%. These occur in all the sites and are classified into different groups depending on the nature and orientation of the scraping edge. Specimens are made on flakes of different shapes such as triangular, rectangular and few are amorphous. Retouched on the straight margins on dorsal side or both the dorsal and the ventral sides. Few flakes have retained patches of cortex. Depending upon the shape and functional aspect, these are classified under the following sub groups.

Table No. 65

Typological classification of scrapers

Sl. No.	Tool type	Total No. of tools	Percentage
1	Side scraper	25	71.42%
2	End scraper	5	14.28%
3	Hollow scraper	2	5.72%
4	Round scraper	3	8.58%
	Total ...	35	100.00%

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Side scraper: Side scraper seems to be almost an indispensible component in the Mesolithic industries of the Upper Tungabhadra valley and in the present context, these account for 16.58% of the total collection. 15 specimens were picked up from the river bank and the rest from the bank of a stream. These are fabricated on different shapes of flakes, the most dominant being rectangular in shape. Deliberate attempts seem to have been made to obtain a specific form and then sides are blunted with retouching. Close marks at acute angle exhibit some sort of pressure technique. Flakes are usually thick at the centre. Few specimens have patches of pebble cortex on the upper surface.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	4	16%	10-20 mm	18	72%	1-10 mm	17	68%
2	20-30 mm	18	72%	20-30 mm	7	28%	10-20 mm	8	32%
3	30-40 mm	3	12%						

Length of the scrapers varies between 18 mm and 35 mm. The above table indicates that specimens ranging between 20 mm and 30 mm show high frequency with 72% followed by specimens of 10-20 mm range with 16% and those ranging between 30-40 mm with 12%.

Breadthwise, specimens ranging between 10 mm and 20 mm account for 72% followed by specimens ranging between 20-30 mm with 28%. The maximum and minimum breadth measure 28 mm and and 11 mm respectively.

Thickness of specimens varies between 6 mm and 14 mm. Specimens falling within 10 mm range account for 68%.

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End scraper: These constitute 3.32% of the total collection and 14.28% of the scraper group collection. These have working margins at the distal end and are slopy near the margin. These are thick near the proximal end and a flat surface is distinctly provided, probably for grip while in use. Retouch work is done on both the surfaces along the working margin. Specimens are fashioned on short thick flakes. Their total absence in Sasivehalli collection is notewothy.

Metrical analysis: Avarage length, breadth and thickness of specimens measure 22.4 mm, 18.8 mm and 11.4 mm respectively. Lengthwise, specimens ranging between 20 mm and 30 mm show high frequency (60%) followed by specimens ranging between 10 mm and 20 mm with 40%. Uniformity in breadth, in specimens ranging between 10-20 mm is noteworthy. Thicknesswise, specimens ranging between 10-20 mm dominate with 80%.

Hollow scraper: Only two specimens of this group are available accounting for 1.32% of the total collection. These are made on thick flakes. In both the specimens, left margin is straight and is obtained by removing a flake at oblique angle producing a ridge in the longer axis. Concavity or hollowness is achieved by producing a deep notch in the right side margin. The remaining side margins are then retouched inlucding the notch. These might have been used to fashion some organic material used by the Mesolithic people for hunting. Maximum length, breadth and thickness measure 29 mm, 24 mm and 12 mm respectively and the average measurement is 25.5 mm x 19.5 mm x 10 mm.

Round scraper: These constitute 1.98% of the total collection. These are worked on thick flakes of quartz and almost round in shape. Flake scars diverge at the centre from the margins resulting in obtaining thin working edge alround. These are thick at the centre. Controlled retouching is done alround the margin. Maximum length, breadth and thickness measure 28 mm, 25 mm and 13 mm respectively. Average measurement is 24.6 mm x 23.3 mm x 12 mm.

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Point: These constitute the major group accounting for 24.50% of the total collection. These are made on both thick and thin flakes. Specimens made on thin flakes are more symmetrical. Fairly good representation of points in all the three sites is significant. Depending on the shape and other features, points are divided into the following sub-groups.

Sl. No.	Tool type	Total No.	Percentage
1	Assymmetric point	27	72.97%
2	Symmetric point	7	18.92%
3	Tanged point	3	8.10
		37	99.99%

Assymmetric point: These constitute 72.97% of the collection under points group. Almost all the specimens are fabricated on simple flakes. Few specimens are thick at the centre due to central ridge prevailing along the axis. In most of the specimens, point is achieved by removing a flake obliquely either on the left or right margin near the distal end. In some cases, working point is obtained by producing a notch each with pronounced shoulders on the side margin near the distal end and strengthened by working the ventral side. Points achieved by detaching two flakes at acute angle on dorsal side form the third category.

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Metrical analysis

Sl. No.	Length range	Total No	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	3	11.11%	10-20 mm	24	88.88%	1-10 mm	24	88.88%
2	20-30 mm	22	81.48%	20-30 mm	3	11.11%	10-20 mm	3	11.11%
3	30-40 mm	2	7.40%						
			99.99%			99.99%			99.99%

The maximum and minimum length of points measure 39 mm and 18 mm respectively. Specimens ranging between 20 mm and 30 mm dominate the collection with 81.8%.

Breadthwise, specimens fall into two groups, dominated by specimens ranging between 10 mm and 20 mm with 88.88%.

Thicknesswise also, specimens fall into two groups. 88.88% of the specimens range between 1 mm and 10 mm.

Symmetric point: These constitute 18.92% of the points group and 4.63% of the total collection. These points are fabricated on flakes and are triangular in shape. One is leaf shaped. Specimens have prominent ridge and shallow flaking marks on the dorsal side with flat and plain ventral side. Bifacially retouched working end and retouched margins, faceted platform are noteworthy features. Both in workmanship and type, these specimens could be compared with 'Teri' points.

Metrical analysis: Lengthwise, all the specimens belong to 20 mm-30 mm group. Breadthwise, the variation ranges between 14 mm and 22 mm. Specimens ranging between 10 mm and 20 mm dominate with 85.7%. Maximum and minimum thickness are 16 mm and 8 mm respectively. Specimens ranging between 1 mm and 10 mm show high frequency with 85.71%.

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Tanged point: These account for 1.98% of the total collection. These are made on flakes. At the proximal end, a notch is produced on one side of the margin to form a tang for hafting. Slight retouch of margins and tip is noteworthy. Maximum length, breadth and thickness measure 40 mm, 28 mm and 14 mm respectively and the average measurement is 31.3 mm x 21 mm x 12 mm.

Scraper cum point: These constitute 1.32% of the total collection. These are made of simple flakes. Both the specimens are worked on the dorsal side. Ventral side is plain. Traces of Levallois technique is noteworthy. Another has a ridge running in the longer axis. Working margins are retouched besides the point. Average length, breadth and thickness measure 26.5 mm, 15.5 mm and 9.5 mm respectively.

Borer: These constitute 1.98% of the total collection. These are made on thick short flakes. The working tip is obtained by producing a notch on one side of the margin near the distal end and is retouched. Average length, breadth and thickness measure 22.6 mm, 15.6 mm and 9 mm respectively.

Lunate: These constitute 7.94% of the total collection. These are fabricated on flakes and bladish flakes. Specimens made on short flakes are broad at the centre and have slopy cutting edge and the convex edge is produced by deliberate retouching. Lunates made on bladish flakes have short cutting and the distance between working edge and convex edge is narrow. Secondary retouch is more refined in these specimens and exhibit signs of usage of the working edge. All are roughly crescentic in shape. Their absence in Sasivehalli is significant. Average length, breadth and thickness measure 30 mm, 16 mm and 8 mm respectively.

Blade group: These account for 39% of the total collection, and are fabricated on short thick blades. Depending on their type, working etc., these have been classified into following sub-types and analysed.

Sl. No.	Type	Total No.	Percentage
1	Simple blade	14	23.72%
2	Retouched blade	23	38.98%
3	Bakced blade	9	15.25%
4	Points on blade	13	22.04%
	Total ...	59	99.99%

Simple blade: These constitute 9.28% of the total collection. The low percentage of occurrence in all the three sites is perhaps due to non-availability of suitable Silicious raw materials. These are short and thick, parallel sided blades made on quartz and rock-crystal.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	9	64.28%	1-10 mm	3	21.42%	1-5 mm	4	28.57%
2	20-30 mm	5	35.72%	10-20 mm	11	78.58%	5-10 mm	10	71.43%

The maximum and minimum length of specimens measure 24 mm and 15 mm respectively and those ranging between 10 mm and 20 mm dominate with 64.28% followed by specimens ranging between 20 mm and 30 mm with 35.72%.

Breadth of specimens varies between 8 mm and 17 mm and those ranging between 10 mm and 20 mm dominate with 78.58%. Maximum thickness of specimens measures upto 10 mm. Those ranging between 5 mm and 10 mm show high frequency with 71.43%.

Retouched blade: These constitute 15.24% of the total collection. These are made on thick short blades of quartz. Invariably, these have mid ridge along the longer axis. Retouching is done along the margins on dorsal side as well as ventral side and few have retained patch of cortex.

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Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	12	52.18%	1-10 mm	2	8.70%	1-10 mm	21	91.30%
2	20-30 mm	10	43.48%	10-20 mm	20	86.95%	10-20 mm	2	8.70
3	30-40 mm	1	4.34%	20-30 mm	1	10.34%			
		23	100%		23	100%		23	100%

The above analysis indicates that blades under study are short, broad and thick. Length of specimens varies between 17 mm and 33 mm.

Specimens ranging between 10 mm and 20 mm dominate with 52.18% closely followed by specimens ranging between 20 mm and 30 mm with 43.48%. Breadthwise, specimens ranging between 10 mm and 20 mm show high frequency with 86.95%. Maximum and minimum thickness of specimens measure 11 mm and 6 mm respectively and those which fall in the group of 1 mm to 10 mm dominate with 91.30% of the total collection.

Backed blade: These constitute 5.96% of the total collection and 15.25% of the blade group collection and are made on short blades with rough parallel sides. The sharp and thin working margin is attained by removing a thin blade sloping towards the working edge. The other margin is blunted by removing small flakes or chips. Some have usage marks.

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Metrical analysis

Sl. No.	Length range	Total No.	Perce-ntage	Breadth range	Total No.	Perce-ntage	Thickness range	Total No.	Percen-tage
1	10-20 mm	6	66.66%	10-20 mm	9	100%	1-10 mm	9	100 %
2	20-30 mm	3	33.33%						

Except in length, uniformity is observed in both breadth and thickness. Maximum and minimum length of specimens measure 24 mm and 15 mm. Specimens ranging between 10 mm-20 mm dominate with 66.66%. Breadth and thicknesswise, specimens fall between 10 mm-20 mm and 1 mm-10 mm range respectively accounting for 100% each.

Point on blade: These constitute 8.61% of the total collection. All are of assymmetric group except one specimen with retouching done on the side margins converging at the distal end. In few specimens, points are obtained by producing a small notch near the tip along the side margins or by removing thin elongated flakes. The tip is then strengthened by removing a small flake on the ventral side, a feature common to flake group also.

Metrical analysis

Sl. No.	Length range	Total No,	Perce-nrage	Breadth range	Total No.	Perce-ntage	Thickenss range	Total No.	Percen-tage
1	10-20 mm	10	76.92%	10-20 mm	13	100%	1-10 mm	13	100%
2	20-30 mm	3	23.08%						
			100%						

The above analysis indicates uniformity in breadth and thickness while in length among two groups. Specimens ranging between 10 mm and 20 mm dominate with 76.92%.

Core: These constitute just 1.98% of the total collection. These are of different shapes. Parallel sided flutings and single platform are noteworthy. Occurrence of few cores indicate that only finished tools were brought to camps from the nearby factory sites in the river bed. However, no evidence is encountered in the survey. Average length, breadth and thickness measure 23.6 mm, 20 mm and 14.6 mm respectively.

Technique: flakes of different shapes used for manufacturing is detached from the core by using stone hammer technique as already noticed in the two categories in the same valley dealt with above. Instances of using Levallosian flake is rare. For obtaining parallel sided blades and for trimming the convex margins of lunate and in secondary retouch, controlled pressure flaking seems to have been used. Use of soft hammer technique is evident from zigzag margins of few specimens. A sharp thin edged implement may have been used for removing thin blades from quartz cores.

General observations: Of the tool types of each of the three categories, the scraper points in the first two categories are dominant and in the third category, the blade and other related Microliths are more, than in the first two categories. Thus, there appears to be two distinct traditions, the scraper point complex and the blade complex. Even in this stage, the former has a long history appearing distinctly in the Mid-Palaeolithic stage. In the Upper Palaeolithic levels in North Karnataka along with blade and burin complex is also found scraper-point assemblage. In the region under study also, in the lone Upper Palaeolithic site, this feature has been found. However, as explained above, in a few sites, for example at Kattebelguli also, there is a vague indication of a transitional stage from Middle to Upper Palaeolithic. The scraper-point assemblage of the Mesolithic in the region of study in all probability is a derivative from the earlier tradition, but produced through improved technique and demunitive form in accordance with the tendencies and requirement of the people.

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Apart from tool types, the technique of their manufacture, rock material, etc., the location and the extent of the sites are particularly noteworthy. The sites of this category are invariably located on the banks of the rivers or their tributaries. The extent of the sites is much larger than those of the first two categories. The people, therefore, were becoming more river bank oriented and increasing in number. Consequently, as evident from the tool types - especially the blade complex now very distinct - in the third category, their activities were mostly concerned with food economy and were becoming more complex and enlarged demographically.

Select specimens are described seperately.

MESOLITHIC - II CATEGORY SITES - THE TUNGA VALLEY

Seven sites noticed in this valley belonging to the II category are situated about ½ Km from the main river bed. Of these, the sites noticed at Tirthahalli, Taluve and Sringeri are on the slopes or peak of the hillocks, while the sites at Sulebailu (behind Guddemaradi hill about 300 m south), Tirthamathur, Nadbur and Hosagadde are noticed near or on the terrace of granitic outcrops.

Environment: Based on the geo-setting, Mesolithic sites of this category can be further classified into two groups. The first group comprises of a lone site situated in the maidan belt dotted with scrub jungles and red soil. Here, the tool bearing deposits are found amidst a low granite outcrop. The remaining six sites are situated in the thick forest region of Malnad. In these sites, vast spread of waste flakes and few finished tools are found on the flat stretches of areas with little soil cover. The occurrence of these sites at higher altitude indicates that these were probably primary sites used exclusively during the high flood activity particularly during the monsoon. Even now, flood level of Tunga rises considerably during the rainy season occupying vast stretch of the bank on either side. It is

quite possible that in the prehistoric time too, this situation might not have been different. Inspite of difficult terrain, with dense forest and moving river stream with steep gradient, Mesolithic people habitated the reigon is a noteworthy point which deserves our attention.

Rock material: Small quartz pebble with brownish surface, small nodules of quartzite, rock-crystal and milky quartz are available in these sites. Small pebbles seem to have been obtained from the nearby river bed while the other raw materials seem to have been obtained from the veins noticed in the nearby granitic outcrops. Bulk of the specimens are made of quartz of different shades, closely followed by milky quartz. Majority of the lunates made on quartzite is particularly noteworthy. Rock crystal has been sparsely used. The Sulebailu assemblage has scrapers made on large flakes probably taken out from medium size pebbles, a feature commonly noticed in the nearby sites of the Bhadra and the Upper Tungabhadra valleys.

Density and typology: It is interesting to note that, all the seven sites are primary sites with heavy percentage of waste flakes found scattered in the surroundings of outcrops probably used as natural anvils. Finished implements occur sparsely. This low percentage might indicate that finished tools are removed to camp sites but occurrence of such sites with implements could not be located. The entire assemblage comprising 166 specimens is classified into different types based on nature and other characters of implements. Sitewise distribution of implements and their percentage is given in the following table.

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Table No. 66

Sitewise distribution of artefacts

Sl.No.	Name of the site	Total No. of artefacts	Percentage
1	Sulebailu	33	21.10%
2	Tirthahalli	15	9.00%
3	Tirthamattur	45	27.10%
4	Taluve	12	7.24%
5	Sringeri	29	17.46%
6	Hosagadde	24	14.46%
7	Nadbur	6	3.64%
		166	100.00%

The above table would indicate that four sites have yielded twenty and above implements accounting for 70% of the collection while the remaining sites, each has yielded less than 10%. The assemblage is further classified into different types. Typewise distribution is shown in the table given below.

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Table No. 67

Typewise distribution of artefacts

Sl. No.	Tools	Sule-bailu	Tirtha-halli	Tirtha-mattur	Taluve	Sringeri	Hosa-gadde	Nada-bur	Total	Perce-ntage
1	Side scraper	3	-	-	-	-	-	-	3	1.80%
2	End scraper	-	-	-	-	-	1	-	1	0.60%
3	Bladish flake	8	4	8	-	9	3	-	32	19.28%
4	Assymmetric point on flake	7	1	8	2	6	3	-	27	16.27%
5	Symmetric point	3	-	1	-	2	1	-	7	4.22%
6	Crescentic point	2	1	5	-	3	1	-	12	7.23%
7	Tanged point	2	1	1	-	-	1	-	5	3.02%
8	Borer	-	-	2	-	-	1	-	3	1.80%
9	Simple blade	4	5	11	3	4	3	1	31	18.68%
10	Point on blade	3	1	2	3	4	2	1	16	9.64%
11	Lunate	1	-	1	2	-	3	3	10	6.04%
12	Trapeze	-	2	-	-	-	2	-	4	2.40%
13	Core scraper	-	-	2	-	-	2	-	4	2.40%
14	Core point	-	-	3	-	1	-	-	4	2.40%
15	Core	2	-	1	2	-	1	1	7	4.22%
	Total ...	35	15	45	12	29	24	6	166	100%

The above table indicates that the industry is mainly composed of Bladish flakes and blades. Percentage of scrapers is very low compared to the Upper Tungabhadra and Bhadra. Both non-geometric and geometric groups are available in the collection. In the following pages, typo-technological features of the various tool groups and their analysis are brought out.

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Flake group: In this category, four specimens are available. These include side scrapers (3) and end scraper (1). These are made on thick flakes, irregular in shape. Working edge is retouched along the margin in patches.

Side scraper: These constitute 1.80% of the total collection. These are simple and irregular in shape. The steep working edge is retouched from the dorsal surface. The average length, breadth and thickness measure 37.66 mm, 27.66 mm and 14.66 mm respectively.

End scraper: One specimen (0.60%) of this type is found in the entire collection. It is made on a thick flake having a prominent central ridge and slopy surface on the dorsal side. It has flaking distal end which is obviously the working end. It is retouched effectively. It measures 24 mm x 19 m x 12 mm.

Bladish flake: These constitute 19.20% of the total collection. These are of different types, the most common being rectangular. Specimens from Sulebailu and Hosagadde are broad and thick. Other specimens are slightly short. Invariably, these have a low central ridge running along the longer axis and slopy surface on one side, shallow flaking and flutings. The working margin is thin and almost parallel in some specimens. Few are retouched along the working margin from one side. Bulb of percussion and faceted platform are noteworthy. Pebble cortex is retained in a few.

Metrical analysis

Sl. No.	Length range	Total No.	Perce-ntage	Breadth range	Total No.	Perce-ntage	Thickness range	Total No.	Perce-ntage
1	10-20 mm	2	6.25%	10-20 mm	18	56.25%	1-10 mm	32	100%
2	20-30 mm	25	78.25%	20-30 mm	13	40.50%			
3	30-40 mm	5	15.50%	30-40 mm	1	3.25%			

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The maximum and minimum length of specimens measure 37 mm and 18 mm respectively. In the length range, specimens of 20 mm and 30 mm range dominate with 78.25%. In the breadth range, specimens of 10 mm and 20 mm dominate with 56.25% closely followed by 20 mm and 30 mm range specimens with 40.50%. The second group seems to have been close similarity in length and breadth. Thicknesswise, all the specimens fall into 1 mm - 10 mm range (100%).

Point: These are of four types and account for 30.72% of the total collection. Mostly, triangular in shape and are made on flakes, bladish flakes and blades. Few are made on core also. Depending on the shape and other features, these have been classified into the following sub-types.

Assymmetric point: These constitute 16.20% of the total collection. These are essentially made on bladish flakes. Point is obtained by a single oblique stroke or by producing a notch near the distal end and is further made thin by removing a small flake from ventral surface. Care is taken to fashion the point and some times the base also. Shallow flake scar and small flutings are seen on both the surfaces.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	9	33.33%	10-20 mm	22	81.48%	1-10 mm	27	100%
2	20-30 mm	18	66.66%	20-30 mm	5	18.52%			

Length range of specimens varies between 18 mm and 30 mm. Those ranging between 20 mm and 30 mm dominate with 66.66%, closely followed by specimens of 10 m and 20 mm range with 33.33%. The maximum and minimum breadth of specimens measure 27 mm and 14 mm respectively. Specimens of 10 mm and 20 mm range show high frequency with 81.48%. Thicknesswise, the entire group falls into 1 mm and 10 mm range (100%).

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Symmetric point: These constiute 4.20% of the total collection. These are made on bladish flake and blades. In few specimens, point is obtained by oblique strokes. The side margins are tapered to converge at the tip. Margins are retouched from opposite side or on dorsal side only. Low central ridge in a few is noteworthy.

Metrical analysis: Except one specimen made of bladish flake (31 mm x 28 m x 9 mm), the remaining points are made on long and short blades. Lengthwise, these belong to 20 mm and 30 mm range (85.71%). The maximum and minimum length being 31 mm and 16 mm respectively. Breadth of specimens varies between 10 mm and 28 mm. Majority of these belong to 10 mm and 20 mm range with 71.42%. Thicknesswise, all the specimens fall in 5 mm and 10 mm range group.

Crescentic point: These constitute 7.20% of the total collection. These are made on both long and short blades. Working point is obtained by oblique stroke or by producing two notches. In a few specimens, pointed end of other margin is retained and when backed, margin merges, with this, a fine strong point is produced. Invariably, central ridge is noticed on one surface in a few specimens and few have slightly depressed dorsal surface. One of the side margins is blunted by close retouching to obtain curved or crescentic shape.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	4	33.33%	1-10 mm	3	25%	1-10 mm	11	91.66%
2	20-30 mm	6	50.00%	10-20 mm	9	75%	10-20 mm	1	8.33%
3	30-40 mm	2	16.66%						

The above analysis indicates three groups in the length range. Of these, specimens ranging between 20 mm and 30 mm showing frequency with 50%, closely followed by 10-20 mm group with 33.33%. The remaining specimens belong to 30-40 mm group with 16.66%. The length of specimens varies between 12 mm and 41 mm.

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Breadthwise, two groups of specimens are available. Specimens of 10 mm and 20 mm range account for 75% and the 1 mm - 10 mm range specimens account for 25%. The maximum and minimum breadth of specimens measure 18 mm and 5 mm respectively. Thicknesswise, specimens belonging to 1 mm and 10 mm range dominate with 91.66%. The minimum and maximum being 3 mm and 11 mm respectively.

Tanged point: These account for 3% of the total collection and are made on bladish flakes. Both the side margins are retouched at the distal end on the upper surface so as to converge at the point. At the proximal end from the left side margin on the dorsal side, a small notch is produced to obtain a narrow tang. Some have small notches on either side of the margin and a long narrow tang. The upper surface of these specimens has fluting marks and few shallow flake scars. The average length, breadth and thickness measure 25.6 mm, 16.8 mm and 8.2 mm respectively.

Borer: These account for 1.80% of the total collection of implements and are fashioned on bladish flakes. The working point or borer is obtained by removing a flake vertically at the distal end along one of the side margins. The other margin is blunted by removing small flakes close to one another and a crescentic back is achieved. The meeting point of worked margin and the natural edge results in a sharp straight working end. A thin flake is removed from ventral surface below the working end to make it thinner and long lasting. Faceted platforms are noticed in the specimens. The dorsal surface is protruded and ventral surface is depressed. The average length, breadth and thickness measure 20.33 mm, 14.66 mm and 7.33 mm respectively.

Lunate: These are made on blades and account for 6% of the total collection. These have almost straight cutting edge and the other margin is backed by close minute retouching. However, in two specimens, pebble cortex is retained along the non-working margin making the specimens look semi-circular on plan. Specimens made on

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short blades are broad at the centre and those made on longer blades are narrow and have slightly projected arc at the centre. Both the surfaces slope towards the cutting edge which usually bear use marks. High percentage of lunates in Taunga valley is noteworthy.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	5	50%	1-10 mm	4	40%	1-10 mm	9	90%
2	20-30 mm	5	50%	10-20 mm	6	60%	10-20 mm	1	10%

The maximum and minimum length of specimens range between 32 mm and 15 mm respectively. Two groups of specimens in the collection show equal distribution with 50% each as shown in the table. Breadth of specimens varies between 7 mm and 24 mm. Specimens of 10 mm and 20 mm range, show high frequency with 60%, closely followed by 1-10 mm range specimens with 40%. Thicknesswise, specimens ranging between 1 mm-10 mm dominate with 90%.

Trapeze: These constitute 2.40% of the total collection and are made on blades. The working edge is thin and straight. The other three sides retouched. One of the specimens has a ridge running parallel to the cutting edge at the centre. This geometric microlithic tool seems to have been used for different purposes like agriculture as well as for hunting. Though small, these are effective in use particularly when used as composites. A deliberate projection at the centre of retouched back is a definite indication of hafting probably to a sickle? The maximum length, breadth and thickness measure 22 mm, 14 mm and 6 mm while the minimum measure 10 mm, 10 mm and 5 mm respectively.

Blade group: Tools of this group account for 27.10 of the total collection. Sub-types of this group include simple blades and point on blades.

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Simple blade: These constitute 18.60% of the total collection and are medium to short in length. Roughly parallel sided and invariably have a central ridge running along the longer axis and slopy surface. Slightly pointed distal end, faceted platforms and bulb of percussion are noteworthy features. Fluting marks on both the surfaces are common.

Metrical analysis

Sl. No.	Length No.	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	1-10 mm	1	3.22%	1-10 mm	15	48.38%	1-10 mm	29	93.54%
2	10-20 mm	23	73.20%	10-20 mm	16	51.62%	10-20 mm	2	6.46%
3	20-30 mm	7	22.58%						

The maximum and minimum length of specimens in the collection measure 26 mm and 7 mm respectively. Specimens ranging between 10 mm and 20 mm show high frequency with 74.20%, closely followed by specimens of 20 mm and 30 mm range with 22.58%. Breadthwise, 10 mm and 20 mm range dominate with 51.62% and they vary between 8 mm and 14 mm. Majority of the specimens fall into 1 mm-10 mm range thickness accounting for 93.54%.

Point on blade: These constitute 9% of the total collection and are made on short blades. Most of these are triangular shaped. Working end is obtained by retouching the margins to converge at the distal end and by producing a small notch near the distal end along the margin or by oblique stroke. Invariably, a prominent central ridge and worked base are other features.

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Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	14	87.50%	1-10 mm	5	31.25%	1-10 mm	16	100%
2	20-30 mm	2	12.50%	10-20 mm	11	68.75%			

Lengthwise, specimens ranging between 10 mm and 20 mm dominate with 87.50%. Breadthwise also, specimens of 10 mm and 20 mm range dominate with 68.75%, while the thickness of specimens belong to one group of 1 mm to 10 mm with 100%.

Core tool: The assemblage comprises of few tools made on cores. These include scrapers (2.40%) and points (2.40%). Scrapers are thick with numerous flutings all over the surface. Working edge is retouched from upper surface. Average length, breadth and thickness measure 22.5 mm, 1.25 mm and 11 mm respectively.

Core points are all cylindrical in shape with flutings. Faceted platform and retouched working end are noteworthy. In a few specimens, natural point is used. The largest of the specimens made on a thick flake measures 60 mm, 59 mm and 31 mm. It is triangular in shape. Prominent central ridge, slopy surface, bifacially retouched thin margins are important features. Occurrence of such big tools in the Mesolithic context is noteworthy. Its exact use is not known. Average length, breadth and thickness of other specimens measure 18.33 mm, 10.66 mm and 7.66 mm respectively.

Core: In the collection, cores of varying shapes constitute 4.2%. Small to medium flutings, flat platform and cortex patches are noteworthy. The maximum and minimum measurement of cores are 32 mm, 19 mm and 14 mm; and 25 mm, 18 mm and 14 mm respectively.

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Technique: The assemblage is composed of bladish flakes, few scrapers, large number of points, blades, trapeze and lunates. Small percentage of core tool is also present. The occurrence of large number of bladish flakes, few having bulb of percussion and flake scars in a few implements indicate the use of soft hammer technique. The use of pressure technique is evident from fluting marks observed in large number of implements. In few bladish flakes, thin working edge is achieved by pressure technique using a broad, thin edged tool either of stone or hard bone. Blunted backs of implements also exhibit controlled chipping by using pressure. Absence of Levallois flake is significant.

General obsrvations: It is interesting to note that the sites are situated in the typical Malnad belt amidst dense forest and rapidly moving river with steep gradient. Unlike in other river valleys, the sites are located about ½ Km to 1 Km away from the river bed. The distance between the sites is also more, varying from 5 Kms to 20 Kms. A few sites, as for example at Tirthahalli and Sringeri, are found on the peak of the hillocks with large quantity of waste flakes which seem to indicate that these were primary sites and the camping sites were not far from these locations. Another point that we may infer is, due to the close proximity of the river, the Mesolithic people of the region seem to have preferred safe spots at higher levels to escape from the havocs of flood. Even today, flood levels engulf the flat area near the river in the region and this situation may not have been different in the Mesolithic times. That Mesolithic people could live both in dry and wet area is very well attested by the presence of numerous sites amidst thick jungles, particularly in the upper reaches of the valley. Interestingly, the assemblage is dominated by blade point group, which is rather significant feature when compared to the assemblages in similar situation in other valleys of the region where scraper groups dominate. This is perhaps due to the ecological factors governing the area and indicates that fashioning of artefacts of a particular type has direct bearing on the needs and habits of the people of the region.

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MESOLITHIC - III CATEGORY SITES - THE TUNGA VALLEY

Two sites belonging to this category are noticed in the lower course of the river Tunga. The distance between the two sites is about 14 Kms.

Environment: Mandagadde and Sirgala fall in the semi-Malnad belt where dense forest diffuse into small patches of semi-deciduous forest. At Mandagadde, Mesolithic artefacts along with large waste flakes are found embedded in the upper layer of sandy silt bed of the river bank indicating its stratigraphic horizon. At Sirgala, these waste flakes with small percentage of implements are found embedded in the thin surface humus overlaying the laterite along the bank. This more or less confirms the stratigraphic horizon observed in Mandagadde. The river flows at a relatively low velocity in this belt and plenty of games, acquatic food and availability of raw materials near the river bed might have attracted the Mesolithic people to settle in these sites, at least temporarily, if not permanently, since no evidence is available in the vicinity about their dwellings, etc.

Rock material: Small to medium sized quartz pebbles having brownish skin are abundantly available in the nearby river bed. Quartz, milky quartz and quartzite have been used to fashion the tools. Majority of the implements are made on quartz.

Density: Both the sites have yielded a small percentage of implements. However, a large number of waste flakes are found in clusters in these sites. One may wonder as to why such waste flakes are found in large numbers in a limited area and hence, deserves further detailed study.

Typology: Totally, 28 implements were collected and their sitewise distribution is as follows:

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Sl.No.	Site	Total No.	Percentage
1	Mandagadde	16	57.14%
2	Sirgala	12	42.86%

The tool kit comprises of bladish flakes, points, few blade tools and borers. These are tabled below.

Table No. 68

Typological distribution of artefacts

Sl.No.	Tool	Mandagadde	Sirgala	Total	Percentage
1	Bladish flake	2	3	5	17.85%
2	Assymmetric point	2	4	6	21.42%
3	Symmetric point	1	-	1	3.58%
4.	Crescentic point	4	1	5	17.85%
5	Borer	2	-	2	7.14%
6	Backed blade	1	-	1	3.58%
7	Simple blade	-	3	3	10.72%
8	Point on blade	4	-	4	14.28
9	Core	-	1	1	3.58%
		16	12	28	100%

In the entire collection, one core is noticed. Waste flakes have not been included for analysis. Main features of each type and their measurements along with percentage is discussed below.

Bladish flake: These account for 17.86% of the total collection. These are of medium size roughly triangular in shape. A few specimens have prominent central ridge and few have retained patches of pebble cortex. Working edge is thin and retouched.

Metrical analysis: The maximum and minimum length of specimens measure 34 mm and 24 mm respectively and 75% of these range between 20 mm and 30 mm. Breadth of the specimens varies between 1 mm and 10 mm.

Point: These constitute the bulk of the tool kit and account for 42.85% of the entire collection. These are further classified into sub types depending on the nature and other characteristics.

Assymmetric point: These constitute 21.42% of the total collection. These are of medium size made on flakes. Working point is achieved by producing a shallow, broad notch near the distal end and retouched. Invariably the natural edge of the other margin is retained and slightly retouched. The working tip is retouched from both the sides to strengthen it. Irregular margins, worked base are some of the important features. The maximum and minimum length, breadth and thickness measure 34 mm, 24 mm, 11 mm, and 21 mm, 20 mm, 7 mm respectively.

Symmetric point: One specimen (3.57%) of this category is found in the entire collection. It is made on a medium size flake roughly triangular in shape. The side margins are worked and the distal end is obliquely cut to obtain a thin working point. It is thick at the base and has a nipped bulb of percussion on the ventral surface. Length, breadth and thickness measure 31 mm, 26 mm and 12 mm respectively.

Crescentic point: These constitute 17.86% of the total collection of artefacts and are unusual types. Fashioned on thick flakes of quartz, these appear like lunates. However, other features of lunates are absent in them. These have blunted convex margins and a small notch at

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at the distal end; usually thick at the centre. Working point is projected and thin. Faceted platform and low bulb of percussion is noticed in couple of specimens. One of the points is made on a thin elongated blade. These have broad centre and narrow ends. Left margin is almost straight and slightly retouched in two specimens. The maximum and minimum length, breadth and thickness measure 40 mm, 24 mm, 13 mm and; 24 mm, 11 mm and 5mm respectively.

Borer: These constitute 7.15% of the total collection of artefacts. The specimens are made on bladish flakes. The borer point is attained by employing burin technique, i.e., by detaching a small vertical spall along the margin at the distal end. Working tip is retouched.

Blade: These are simple blades accounting for 10.72% of the total collection. These are short and have a central ridge on the dorsal surface. Slopy margins are thin, sharp and parallel sided. On an average, these measure 19 mm, 10.66 mm and 4.33 mm.

Point on blade: This category accounts for 14.28% of the total collection of artefacts. These are made on short, broad blades. Working point is obtained by an oblique stroke at the distal end along the left margin and by retouching the other margin. In one specimen, both the margins are retouched to converge at the distal end. The maximum and minimum length, breadth and thickness measure 24 mm, 15 mm, 4 mm; and 20 mm, 14 mm and 3 mm respectively.

Backed blade: One specimen of this category is noticed. It is made on a broad and thick blade of quartz. the working margin is concave and sharp. The convex margin exhibits uneven step flaking. The length, breadth and thickness measure 31 mm, 17 mm and 10 mm respectively.

Core: In the entire assemblage, only one core could be picked up. It is cylindrical in shape and has parallel sided fluting marks all over the surface. Both ends have flatforms. It measures 28 mm, 22 mm and 16 mm.

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Technique: The assemblage comprising bladish flakes, points and blade tools exhibit evidence of various techniques prevalent during the period. Stone hammer technique is used to detach flakes from the cores. Numerous parallel sided flutings on the core and in few implements indicate employment of pressure flaking. Secondary retouch work though employed in limited manner, is a definite indication of the use of controlled flaking or chipping through pressure and punching. Absence of Levallois flake is significant.

General observations: The location of the sites in the semi-Malnad belt almost on the river bank and the occurrence of lithic artefacts embedded in the upper layers of silt deposits indicate the tendency of Mesolithic people to move near to the shallow waters.

Another point of interest is that considerable quantity of waste flakes are found in clusters in a limited area. The non-availability of sufficient raw material on the one hand and the profuse occurrence of waste flakes on the other may possibly indicate that finished artefacts were carried to camp sites from these primary sites. The technique, rock material and other aspects of assemblage are similar to other sites of the same category in the adjacent valleys. However, high percentage of point are particularly noteworthy. Although exact use of points for any specific work could not be ascertained, their occurrence as major group of tool kit warrants close study.

MESOLITHIC: I CATEGORY SITES - THE BHADRA VALLEY

Mattigatta is the lone site belonging to the first category in this valley. Location of the site at Mattigatta and other features have already been described in the relevant chapter. The tool assemblage collected from the surface of the site is classified and discussed below.

Environment: The region forms part of the maidan belt with scrub jungles and small trees dotted here and there. The Mesolithic artefats are found mixed with brownish sandy soil and along with small to medium sized pebbles scattered in the open field. Abundant water and rock material seem to have attracted the Mesolithic people to occupy this site.

Rock material: The artefacts are fashioned on two types of rocks namely quartz and rock crystal. Majority of tools are made on quartz. Few artefacts are made on milky quartz also. Pebbles found here and there are of various shapes having brown surface and varying in measurement from 20 mm to 50-60 mm in length.

Density: Implements occur as scatters in an area of about 250 square metres. Their occurrence in a large area with varying types and large quantity of waste flakes besides nodules attest to the features of a factory site.

Typology and analysis: The assemblage comprises of various types of flake and blade tools. Totally forty implements were picked up from the surface. Flake group accounts for 67.5% and the blade group accounts for 25% of the total collection. Cores constitute 7.5%. Typewise distribution and their percentage is given in the table below. Large quantity of waste flakes have not been included in the study.

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Table No. 69

Tool types - The Bhadra valley

Sl. No.	Tool type	Total No.	Percentage
1	Side scraper	6	15.0%
2	End scraper	2	5.0%
3	Borer	1	2.5%
4	Point	18	45.0%
5	Simple blade	3	7.5%
6	Backed blade	4	10.0%
7	Point on blade	3	7.5%
8	Core	3	7.5%

Flake group: This group is dominated by points and side scrapers. Other types include end scrapers and borer.

Side scraper: These constitute 15% of the total collection. These are made on thick end flakes and small ordinary flakes of varying shape. Use of Levalloisian flake is noteworthy. Faceted platform, retouched working margins and the retaining of cortex patch are some of the significant features.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-30 mm	5	83.33%	10-20 mm	3	50%	1-10 mm	1	16.66%
2	30-40 mm	1	16.66%	20-30 mm	3	50%	10-20 mm	5	83.33%

A cursory glance at the table indicates uniformity in ratio between the length, breadth and thickness.

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End scraper: These constitute 5% of the total collection and are made on thick short flakes. The working edge at the distal end is retouched from both the sides in one tool while the other has shallow flakes on the ventral side only. Both are thick at the centre. Average length, breadth and thickness measure 28.5 mm. 17.5 mm and 14.5 mm respectively.

Borer: Borer constitutes 2.5% of the total collection. The working tip is produced by removing two notches on either side at the centre of the longer axis of the margin and the dorsal side is retouched. It measures 31 mm, 16 mm and 11 mm in length, breadth and thickness respectively.

Point: These constitute 45% of the total collection. Depending on the nature and shape, these are classified in to assymmetric and symmetric groups.

Assymmetric point: These constitute 37% of the total collection. These are made on flakes of varying shapes and thickness. Working point is obtained by varying methods. In some, by removing a single flake obliquely near the distal end along one margin and retouching the other and by producing two notches on either side of the distal end of the margins in another type. Artefacts are essentially triangular in shape with straight flat base and worked along the the margins from the middle leaving prominent shoulder like projections. Faceted platform in a few is noteworthy. Most of these points exhibit working below the tip on ventral side probably to attain thin and strong point.

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Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-30 mm	13	86.66%	10-20 mm	10	66.66%	1-10 mm	8	53.33%
2	30-40 mm	2	13.33%	20-30 mm	5	33.33%	10-20 mm	7	46.66%

The maximum and minimum length of specimen measure 33 mm and 20 mm respectively. Specimens ranging between 20 mm and 30 mm dominate with 86.66%. Specimens ranging between 10 mm and 20 mm dominate in the breadth range with 66.66%. Thicknesswise, specimens ranging between 1-10 mm show high frequency with 53.33% closely followed by the specimens ranging between 10-20 mm with 46.66%.

Symmetric point: These are fashioned on small bladish flakes and constitute 7.5% of the total collection. The side margins converging at the distal end are retouched either on one side or from both the sides of the margins. Point tip is retouched from ventral surface. These are short curved at the proximal end and thin in section. On an average, these specimens measure 19.66 mm x 16.33 mm x 8 mm.

Blade group: These are made on small broad blades and constitute 25.5% of the total collection. Three types of tools are available in the assemblage and the same is discussed below.

Simple blade: These are roughly parallel sided. Prominent central ridge, slopy surface, faceted platform and flutings are some of the important features. Average length, breadth and thickness measure 18 mm, 13.33 mm and 10 mm respectively.

Backed blade: These constitute 10% of the total collection. These are made on short broad blades of quartz. The slopy cutting or working edge is retouched from the dorsal side. The other convex margin is

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backed by controlled pressure flaking. These are more refined than their counterparts in the adjacent valley.

Point on blade: These constitute 7.5% of the total collection. These are made on fluted blades having rough parallel sides. Working point is attained by removing two notches on either side of the margin from the dorsal at the distal end.

Core: These constitute 7.5% of the total collection. These are roughly cylindrical in shape. Flutings of varying length, flat platform and cortexed surface are some of the important features.

Technique: The assemblage comprises of flake and blade group classified into different types on the basis of shape, nature, etc. Flakes are of medium size. Few exhibit Levalloisian technique. Stone hammer technique seems to have been adopted for removing flakings obliquely along the margins to produce points. Flutings and blunted convex margins indicate use of pressure technique. Minute retouching in low angle along the working margin exhibits the use of controlled flaking and punch.

General observations: It is not possible to assess the extent of the culture of this category from a lone site found in the valley. Another point of interest is that the site is situated close to the river unlike in Upper Tunga where sites of this category are about 3-4 Kms away. However, rock material, techniques adopted and tool types are similar to the ones of I category encountered in the adjacent river valleys. The assemblage is dominantly composed of scraper-point group. It is interesting to note the high percentage of points constitute 52% of the entire collection, thereby indicating frequent common use of this type.

MESOLITHIC - II CATEGORY SITES - THE BHADRA VALLEY

Mesolithic sites of this category occur in the valley on the terraces of granite hillocks in six locations of which the site at Gondi is almost on the peak of the hill at an altitude of 600 m overlooking the river.

Environment: The area of the region belongs to the maidan belt with scrub jungles and patches of semi-deciduous forests near Gondi. Artefacts are found embedded in the reddish soil capping granite outcrops. Occurrence of large number of waste flakes also indicates that these were primary sites and their habitation camps were not far away.

Rock material: River borne quartz pebbles of small to medium size measuring 60 mm (length), 40 mm (breadth) and 30 mm (thickness) of different colours such as white, pink, etc., have been used for manufacturing artefacts. Flakes with cortex are found strewn all over along with fluted cores of quartz. Possibilities of using the quartz veins in the granite outcrops near the site can not be ruled out. The bulk of the assemblage is fashioned on quartz while small percentage of implements are fashioned on milky quartz as well as rock crystal.

Density and typology: The entire assemblage is classified into different types on the basis of nature and form. Totally 175 implements including cores from six sites have been classified and analysed. Sitewise distribution of the specimens and their percentage is given in the following table. Large number of waste flakes collected from these sites have not been included.

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Table No. 70

Sitewise distribution of artefacts

Sl.No.	Site	Total No.	Percentage
1	Holebelagal	17	9.71%
2	Dasarakalhalli	42	24.00%
3	Malenahalli	29	16.58%
4	Kagikodumagge	10	5.71%
5	Bommnkatte	49	28.00%
6	Gondi	28	16.00%
	Total	175	100.00%

The above table indicates that two sites have yielded 52% of the total collection and the other four sites account for the remaining 48% of the assemblage. typewise distribution of artefacts in these sites are given below.

Table No. 71

Typological distribution of artefacts

Sl. No.	Tool		Kagi-Kodumaggi	Dasara-Kalhalli	Hole-Belagal	Malena-halli	Bomman-katte	Gondi	Total
1	Side scraper	...	1	2	1	-	4	2	10
2	Side end scraper	...	1	4	2	3	3	2	15
3	Round scraper	...	-	-	-	2	2	1	5
4	Point on flake	...	2	8	8	4	14	9	45
5	Bladish flake	...	2	7	-	5	3	5	22
6	Lunate	...	2	1	1	-	2	1	7
7	Simple blade	...	-	7	-	3	7	-	17
8	Retouched blade	...	1	3	2	-	-	4	10
9	Backed blade	...	-	-	-	4	4	-	8
10	Point on blade	...	1	4	3	4	6	2	20
11	Burin	...	-	-	-	1	-	1	2
12	Core	...	-	6	1	2	4	2	15
	Total	...	10	42	17	28	49	29	175

The assemblage comprises of flake tools, bladish flakes and blades of different varieties and points. These have been discussed in detail below.

Flake group: Flake tools constitute bulk of the collection with 60%. These include varities of scrapers, points, lunates and bladish flakes of different shapes. These are thick and broad, have faceted platform. Occasional bulb of percussion and cortexed surface are other important features.

Scraper: Scrapers constitute 17.14% of the total collection. Depending on the nature and type of working, these have been classifed into sub types. Specimens are made on thick end or side flakes, amorphous in form. All are made on quartz. sub types are detailed below.

Side scraper: These constitute 5.17% of the total collection and 33.33% of the scraper group. Made on thick flakes of quartz, these are thick and the margins are usually worked. Pebble cortex is retained in a few.

Metrical analysis

Sl. No.	Length range	Total No.	Perce-ntage	Breadth range	Total No.	Perce-ntage	Thickness range	Total No.	Perce-ntage
1	20-30 mm	3	30%	20-30 mm	9	90%	10-20 mm	10	100%
2	30-40 mm	6	60%	30-40 mm	1	10%			
3	40-50 mm	1	10%						

Artefacts ranging between 30 mm and 40 mm in length account for 60%, followed by the group of 20 mm and 30 mm range with 30%. The maximum and minimum length measure 47 mm and 26 mm respectively. Breadth varies between 23 mm and 34 mm. The artefacts ranging between

20 mm and 30 mm are the largest accounting for 90%. Majority of artefacts range between 13 mm and 16 mm in thickness while the minimum and maximum being 10 mm and 20 mm respectively.

Side end scraper: These constitute 8.57% of the total collection and 50% of the scraper group collection. These are made on thick quartz flakes of varying sizes. Functionally the lateral margins and the distal end is worked from one side or both the sides. Steep flaking is towards the working edge. These have thick flat ovaloid or bi-convex base on plan. Artefacts from Gondi are rectangular shaped and exhibit controlled working.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-30 mm	7	46.66%	10-20 mm	4	26.66%	1-10 mm	3	20%
2	30-40 mm	6	40.00%	20-30 mm	9	60.00%	10-20 mm	12	80%
3	40-50 mm	2	13.33%	30-40 mm	2	13.33%			

Lengthwise, three groups are descernible. Maximum and minimum length measures 42 mm and 22 mm respectively. Those falling in the range of 20 mm and 30 mm show high frequency with 46.66%, followed by the group of 30 mm and 40 mm range with 40%. Breadthwise, measurement varies between 19 mm and 31 mm. Tools of 20 mm and 30 mm range dominate the collection with 60%.

Thicknesswise, among the two groups, 10 mm and 20 mm range dominates with 80% and the remaining of 1 mm and 10 mm with 20%. Maximum and minimum thickness measure 19 mm and 7 mm respectively.

Round scraper: These form an important tool type and constitute 2.85% of the total collection and 16.66% of the scraper group collection.

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These are made on medium sized irregular flakes. Bifacially flaked, zigzag and thin working end. Few are cortexed and thick at the centre.

Metrical analysis: Somewhat uniform in length as well as breadth, these fall in the range of 20 mm and 30 mm. Thicknesswise also, these fall into one group of 10 mm and 20 mm range. The maximum and minimum length, breadth and thickness measure 28 mm, 27 mm, 15 mm; and 22 mm, 22 mm and 11 mm respectively.

Point: These constitute 28.28% of the total collection. These are fashioned on both flakes and bladish flakes of quartz varying shapes of which irregular triangular shape is common. Working point is obtained by producing notches at the tip of the distal end from one side or both the sides and the margin is retouched. Another form of obtaining point is by removing a flake obliquely along the margin at the distal end. Point or tip is retouched to make the tool workable and strong. Those made on thick flakes have prominent central ridge and slopy surface on one side. Few are worked on the convex margins but they can not be grouped under symmetric point. In a few, pebble cortex is retained in patches. Holebelgal and Malenahalli artefacts are more symmetric in form and exhibit refined workmanship.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	4	8.69%	10-20 mm	29	63.05%	1-10 mm	32	69.57%
2	20-30 mm	35	76.10%	20-30 mm	16	34.78%	10-20 mm	14	30.43%
3	30-40 mm	7	15.21%	30-40 mm	1	2.17%			

Length of artefacts varies between 19 mm and 39 mm. 20 mm and 30 mm range dominates with 76.10%. Breadthwise, 10 mm and 20 mm range group shows high frequency with 63.05%, followed by 20 mm and 30 mm range group with 34.78%. The maximum and minimum breadth measure

36 mm and 13 mm respectively. Thicknesswise, 1 mm-10 mm range group dominates with 69.57%, closely followed by 10 mm and 20 mm group with 30.43%.

Bladish flake: These constitute 12.57% of the total collection. Made on quartz, these are of different shapes and are short, thick and broad. Slopy working edges are trimmed in a few and others are with thin sharp edges, devoid of workmanship. Flutings in a few are noteworthy. Their total absence in Holebelkal is significant.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	2	9.10%	10-20 mm	18	81.18%	1-10 mm	19	86.36%
2	20-30 mm	20	90.90%	20-30 mm	4	18.18%	10-20mm	3	13.63%

Length varies between 18 mm and 29 mm. 20 mm and 30 mm range dominates with 90.90%. Maximum and minimum breadth measure 27 mm and 13 mm respectively. 10 mm and 20 mm range shows high frequency with 81.18%. Thickness range between 6 mm and 13 mm. 1 mm and 10 mm range account for 86.36% of the total collection.

Lunate: These constitute 4% of the total collection. These are made on bladish flakes and blades of quartz. Slopy and short cutting edge, short point at the distal end and the broad distance between the working edge and convex blunted margin are noteworthy. The other convex margin has minute flutings and flake scars.

Metrical analysis: Length of specimens varies between 18 mm and 43 mm. 20 mm-30 mm shows high frequency with 71.42%. Maximum and minimum breadth of specimens measure 26 mm and 10 mm respectively and those ranging between 10 mm and 20 mm dominate with 71.42%. Most of the artefacts (85.71%) fall within 10 mm range.

Blade group: This is another important group with different tool types and account for 31.41% of the total collection. Depending on the shape and nature of artefacts, these have been classified and discussed as below.

Simple blade· These constitute 9.71% of the total collection and 32.72% of the blade group collection. These are short and broad, devoid of usage marks. Central ridge running along the longer axis with slopy sides and flutings are some of the important features.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	3	17.64%	10-20 mm	17	100%	1-10 mm	17	100%
2	20-30 mm	13	76.47%						
3	30-40 mm	1	5.88%						

Only length range exhibits three groups dominated by specimens of 20 mm and 30 mm range with 76.47%. Breadth and thickness also fall within one range group and exhibit slight uniformity.

Retouched blade: These constitute 5.71% of the total collection and 18.18% of the blade group collection. These are made on both short and medium sized blades. Convex, concave and straight working edge are slightly retouched either on one side or on both the sides. Central ridge and slopy surface, fluting marks, plain platform are noteworthy features.

Metrical analysis: Lengthwise, 20 mm and 30 mm range dominates with 70% and the remaining 30% falls into 10 mm and 20 mm range. Breadth range varies between 10 mm-20 mm (100%). thicknesswise, artefacts fall between 6 mm and 9 mm range (100%).

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Backed blade: These constitute 4.57% of the total collection and 14.55% of the blade group collection. These are fashioned on slightly broader parallel sided blades. Thin sharp working margin is straight or concave, retouched on the dorsal or ventral side. The other convex margin is blunted by chipping and fluting using pressure technique.

Metrical analysis: The maximum and minimum length measure 33 mm and 19 mm respectively. 20 mm and 30 mm range group dominates with 62.5%. Breadthwise, all fall into 10 mm and 20 mm range (100%). 87.5% belong to 1 mm and 10 mm range in thickness.

Point on blade· These constitute 11.42% of the total collection and 34.55% of the blade group collection. These are made on parallel sided blades of both longer and shorter varieties. Working points are attained by removing small flakes at the dorsal end or by retouching the distal end to the desired shape. Tips are short and sharp. One of the specimens has convex margin on one side. Plain platform and cortexed surface are other noteworthy features.

Metrical analysis

Sl. No.	Length range	Total No.	Perce-ntage	Breadth range	Total No.	Perce-ntage	Thickness range	Total No.	Percen-tage
1	10-20 mm	11	55%	1-10 mm	4	20%	1-10 mm	20	100%
2	20-30 mm	9	45%	10-20 mm	16	80%			

Maximum and minimum length measure 32 mm and 12 mm respectively. Those ranging between 10 mm and 20 mm dominate with 55% closely followed by 20-30 mm group with 45%. Breadth varies from 9 mm to 19 mm and those ranging between 10-20 mm show high frequency with 80%. Thicknesswise, all fall into one group of 1 mm-10 mm (100%).

Burin: It is made on a thick fluted blade of quartz. The burin facet is obtained by removing a spall vertically from the end of the blade along the left side margin. The working tip is sharp and slightly curved. Dorsal side has flutings. Ventral side is plain. Margins are blunted by pressure flaking. Length, breadth and thickness measure 25 mm, 12 mm and 7 mm respectively.

Core: These constitute 8.57% of the total collection. Majority of these are cylindrical in shape. Two to five parallel sided flutings of varying measurement, numerous platforms and cortex patches are other noteworthy features.

Technique: flaking is done by using a small stone hammer or by a wooden hammer. Cores exhibit narrow and broad flutings indicating use of punch or pressure to obtain blades. Retouching done on the scrapers and points show controlled flaking.

General observations: The occurrence of sites even at an altitude of 600 m above the M.S.L. is particularly noteworthy. Secondly, lithic artefacts are preserved largely as primary refuse. Majority of sites are located at a distance of 3 Km from each other in the lower reaches and their occurrence in a limited area in the maidan region is particularly noteworthy. The sites in the Bhadra are rather large in extent than the ones noticed in the Upper Tungabhadra of the same category. Tools made out of river borne pebbles are more in number than the tools made from using quartz available in the nearby granitic hillocks.

Another feature worthy of note is the occurrence of tools embedded in the red humus deposit covering the bed rock, as for example at Malenahalli, a feature akin to Jalahalli (Seshadri, 1956). Situation of sites, tool types, technqiues adopted to fashion the tools and the rock material used are all similar to the features noticed in the Upper Tungabhadra valley.

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MESOLITHIC - III CATEGORY SITES - THE HEMAVATI VALLEY

Intensive survey in the valley revealed five sites of this category. Artefacts are found strewn on the slopes of the sections and on the top of the river bank. While in some sites, these are found in loose condition in clusters indicating their primary nature, in other sites, these occur as secondary refuse, and differ typo-technologically from the assemblages of sites situated under geo-setting elsewhere in the Upper Tungabhadra and the Tunga valleys. The main features of the assemblage of the Hemavati valley are discussed below.

Environment: The sites are located in the maidan, semi-Malnad belt of the region where semi-deciduous forest dissolve into scrub jungles and the river almost enters into its mature phase, a situation ideally suited for hunting in the vast open land and an assured, continuous supply of acquatic food in the shallow waters. Possibilities of these factors attracting the Mesolithic people to habitat the area can not be ruled out. Occurrence of Mesolithic artefacts in two sites which yield Middle Palaeoliths is significant as it indicates continuous occupation.

Rock material: Large quantity of pebbles of quartz and rock-crystals of varying dimensions available in the river bed in these sites have been used. Except three implements of rock-crystal, the entire assemblage is made on quartz of white and grey colour. While fine grained quartz is used to fashion blade tools, coarser variety is used for fashioning other types of tools.

Density and typology: In two sites, artefacts are found spread in vast area in clusters along with huge quantity of waste flakes which are evidently primary refuse. In the remaining sites, only a few artefacts are found with a low percentage of waste flakes. These may be secondary refuse and the primary base camps may not be far away. However, no evidence could be traced..

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Table No. 72

Sitewise distribution of artefacts

Sl.No.	Site	Total No.	Percentage
1	Kattebelgulı	7	8.28%
2	Kattehosallı	14	16.47%
3	Cholenahallı	17	20.00
4	Mudalahıppe	15	17.60%
5	Maranayakanahallı	32	37.65%
	Total ...	85	100.00%

Evıdently bulk of the assemblage belong to the last two sıtes. As ındıcated above, totally 85 fınıshed artefacts were collected and classıfıed ınto dıfferent types dependıng on the nature, workıng and other characterıstıcs of the ımplements. Sıtewıse dıstrıbutıon of the tool types are gıven ın the table below.

Table No. 73

Typewise distribution of artefacts

Sl. No.	Tools	Katte-belguli	Katte-hosalli	Cholena-hallı	Mudala-hıppe	Maranayakana-hallı	Percentage
1	Side scraper	1	2	1	4	4	13.64%
2	Round scraper	-	-	-	-	2	2.28%
3	Bladish flake	2	3	4	3	5	19.32%
4	Assymetric point	1	7	5	6	10	32.95%
5	Symmetric point	1	-	1	2	-	4.54%
6	Borer	-	-	-	-	2	2.28%
7	Simple blade	-	-	2	1	1	4.54%
8	Retouched blade	1	1	1	1	3	7.95%
9	Backed blade	1	1	1	-	2	5.68%
10	Cores	-	-	2	1	3	6.82%

Various types and their features with analysis and percentage are discussed below.

Side scraper: Side scrapers are made on thick flake and account for 13.64% of the total collection of artefacts. Straight margins retouched from one or both the sides, prominent mid ridge with slopy surface on either side are some of the important features.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-30 mm	2	16.16%	20-30 mm	7	66.66%	10-20 mm	10	83.33%
2	30-40 mm	5	41.66%	30-40 mm	4	33.33%	20-30 mm	2	16.66%
3	40-50 mm	5	41.66%						

Lengthwise, scrapers belong to three groups. The first two of 30 mm-40 mm and 40 mm-50 mm range account for 41.66% each, while the third group of 20-30 mm range accounts for 16.66%. The maximum and minimum length of scrapers measure 49 mm and 25 mm respectively. Breadthwise, measurement varies between 20 mm and 42 mm and 20 mm and 30 mm range dominates with 66.66%. Thicknesswise, 10 mm-20 mm range group shows high frequency with 83.33%. It is evident from the analysis that specimens are quite large in size and no standardisation is noticeable.

Round scraper: These constitute 2.28% of the total collection and are made on thic flakes of grey coloured quartz. These are thick at the centre, bifacially worked and have thin zigzag working margin. Roughly round in shape. The maximum and minimum length, breadth and thickness measure 36 mm, 32 mm, 13 mm; and 27 mm, 25 mm and 10 mm rspectively.

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Bladish flake: These constitute second largest group of artefacts forming 19.32% of the entire collection. Varying in measurement, these are of rectangular as well as triangular shape and thick at the middle. Bulb of percussion, central ridge running along the axis, retouched margins on the dorsal side are noteworthy features.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-30 mm	8	47.10%	10-20 mm	8	47.10%	1-10 mm	11	64.70%
2	30-40 mm	7	41.14%	20-30 mm	7	41.14%	10-20 mm	6	35.30%
3	40-50 mm	2	11.76%	30-40 mm	2	11.76%			

Bladish flakes are uniform in size. In length, 47% range between 20 mm and 30 mm closely followed by the group ranging between 30 mm and 40 mm with 41.14%. 40 mm-50 mm range accounts 11.76%. In breadth, 10 mm and 20 mm range dominates with 47.1% while those in the range between 20 mm and 30 mm account for 41.14% and the rest belong to 30 mm to 40 mm range with 11.76%. Similarly in thickness, 1 mm and 10 mm range group accounts for 64.70% and the rest belong to 10 mm and 20 mm range (35.30%).

Point group: This is the largest group constituting 37.5% of the total collection of artefacts. These are simple types made on bladish flakes and are classified into two sub types, assymmetric and symmetric points.

Assymmetric point: These constitute 32.95% of the total collection of artefacts. Majority of these are made on thick, broad, bladish flakes, medium in size, invariably having a thick central ridge running along the longer axis. Working point is obtained by striking a single oblique stroke at the distal end and in few, two oblique strokes along the margin to produce points. Retouched tip and side margins are other

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noteworthy features. Triangular and irregular cross section is common. Points from Mudalahippe and Maranayakanahalli are distinctly different from each other. While bladish flakes were preferred in the former, thick and later elongated bladish flakes having a prominent central ridge were used in the latter.

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-30 mm	15	51.72%	10-20 mm	18	62.06%	1-10 mm	19	65.52%
2	30-40 mm	10	34.48%	20-30 mm	11	37.94%	10-20 mm	10	34.48%
3	40-50 mm	4	13.80%						

Lengthwise, 20 mm and 30 mm range accounts for 51.72%. 30 mm to 40 mm and 40 mm to 50 mm range account for 34.48% and 13.80% respectively. Breadthwise, specimens of 10 mm to 20 mm range and 20 mm to 30 mm range groups account for 62.06% and 37.94% respectively. Similarly in thickness also, two groups of 1 mm to 10 mm range and 10 mm to 20 mm range account for 65.52% and 34.18% respectively.

Symmetric point: These constitute 4.54% of the total collection. Fashioned on thick bladish flakes, medium in size, these are triangular in shape. One of the margins is slightly retouched while the other margin is straightened up by an oblique stroke at the distal end evidently to obtain thick and short working point. Plano-convex cross sections and diffused bulb of percussion are other noteworthy features.

Metrical analysis: Average length, breadth and thickness measure 28.25 mm, 22.5 mm and 9.5 mm respectively. 50% of the points measure 30 mm and above in length. Breadthwise, 20 mm and 30 mm range group dominates with 75% and similarly in thickness, 75% of the points fall in 1 mm and 10 mm range group.

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Borer· These constitute 2.28% of the total collection. These are made on bladish flakes. Working end is obtained by producing a notch at the distal end of the left margin or by striking a blow at the distal end to remove a flake along the length of the margin, the pointed tip is then retouched. Zigzag, convex side margin obtained by alternate flaking is noteworthy. Maximum and minimum length, breadth and thickness measure 35 mm, 13 mm, 10 mm, and 29 mm, 20 mm and 6 mm respectively.

Blade group: These account for 18.18% of the total collection. Slightly large in size and exhibiting limited incipient retouch, these are further classified into the following sub types.

Simple blade: These constitute 4.54% of the total collection and 25% of the blade group. Side margins are roughly parallel sided and have thin sharp blade like working ends devoid of use marks. Prominent mid ridge is noteworthy.

Lengthwise, 50% of these measure in between 20-30 mm range and the remaining 50% measure in between 30-40 mm range. Breadthwise, 75% of the blades range between 10 mm and 20 mm and the remaining 25% are in the 30 mm range. Similarly in thickness, 75% of the blades measure between 1 mm and 10 mm and 25% measure between 10-20 mm range.

Retouched blade: These constitute 7.95% of the total collection and 43.75% of the blade group. Made on broad short blades, these have mid ridge, slopy sides on the dorsal surface and are parallel sided. Faint retouching of one side of the margin is noteworthy. While lengthwise, these measure 21 mm on an average, breadth and thicknesswise these belong to 10 to 20 mm and 1 to 10 mm range respectively.

Backed blade: These constitute 5.68% of the total collection and 31.25% of the blade group. These are fashioned on slightly broad and elongated blades. Working margin is almost straight and sharp. The arc in most of the blades are crudely retouched by step flaking.

80% of the blades measure between 30 mm and 40 mm in length. Breadthwise, these measure between 10 mm and 20 mm (100%). Similarly in thickness, 60% of the blades measure between 1 mm and 10 mm and the remaining 40% measure between 10 mm and 20 mm.

Core: These constitute 6.82% of the total collection. These are cylindrical in shape, short and thick. Numerous flutings and flat upper end are other noteworthy features. Percentage of occurrence of these cores does not coincide with the percentage of blade tools in these sites. Average length, breadth and thickness measure 46.60 mm, 34.20 mm and 26.4 mm respectively.

Technique: The assemblage comprises of scrapers, points, bladish flakes and blades of different types. Artefacts of first two groups are fashioned on irregular flakes. Use of stone hammers for detaching flakes might have been used. Zigzag working margin in round scrapers is due to alternate flaking probably using a soft bone as hammer. From the crude irregular flutings on the cores and on few tools, it may be postulated that pressure technique was just making its appearance in this part of the region. This is further attested by the fact that retouching is used sparingly along the working edge exhibiting an incipient stage. All these factors tend to show that the Hemavati assemblage is a precursor to the true Mesolithic stage in region under study.

General observations: It is particularly noteworthy that Mesolithic artefacts are found above the gravels which yield Middle Palaeolithic artefacts at Kattebelguli and Cholenahalli indicating continuous occupation of the area. The Mesolithic people of the region seem to have preferred only coarse grained quartz while their predecessors used close grained chloritic schist. This marked contrast in the use of raw material is a significant feature of the Mesolithic culture in this region. Most of the sites are small in dimension and are located within a limited area of the river bank, the distance between each

site varying between ½ Km-1 Km particuarly in lower course of the river. Whether the same situation prevailed in the upper reaches could not be ascertained since the major portion of the river is submerged in the back waters. Open land with scrub jungles ideally suited for hunting, abundant raw material for fashioning lithic artefacts and assured continuous aquatic food in the shallow waters might have attracted people to habitat this region.

Occurrence of high percentage of blade tools is noteworthy and seems to be a regular feature of the sites of the third category as evidenced in the adjacent river valleys of the region under study. Majority of the tools are fashioned on flakes detached from quartz lumps. Limited use of river borne pebbles is significant.

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MESOLITHIC TOOL TYPES

Figure I : Side scrapers

(1)

River valley : Upper Tungabhadra (I) Site: Hole Arlehalli
Rock material: Milky quartz Tool type: Side scraper
Description: Oval shaped; made on a thick flake. Shallow flake scars on both the surfaces. Scraping edge retouched alternatively from both sides. Thick, convex right lateral margin. Plain platform. Thick at the bottom. Fresh. Measures 5.1 cm x 3.5 cm x 2.4 cm.

Comparable to: No. 3, Pl. XVI, Site near Bangalore (Seshadri, 1956).

(2)

River valley : Upper Tungabhadra (I) Site· Hole Arlehalli
Rock material: Quartz Tool type: Side scraper
Description: Triangular shape; made on a thick pinkish flake. Shallow flake scars on the dorsal side. Plain ventral side. Scraping edge minutely retouched from both the sides. Irregular platform. Thick at the centre and pointed distal end. Fresh. Measures 4.3 cm x 2.7 cm x1.2 cm.
Comparable to: No. 8, Pl. XIV, Jalahalli (Seshadri, 1956).

(3)

River valley : Upper Tungabhadra (II) Site. Haraganahalli
Rock material: Milky quartz Tool type· Side scraper

Description: Made on a thick whitish flake. Bold ridge on the dorsal side besides stepped shallow flake scars. Deep flake scar and a thin coat of blackish patina on the ventral side. Thin working edge bears faint traces of retouch. The other side margin is slightly convex. Deep notch at the distal end. Thick at the centre. Fresh. Measures 4.6 cm x 4.2 cm x 2.1 cm.

Comparable to: No. 3, Pl. XIV, Jalahalli (Seshadri, 1956).

(4)

River valley : Upper Tungabhadra (III) Site: Chikbasur
Rock material: Quartz Tool type: Side scraper

Description: Made on a thin flake. Shallow flake scars near the working margin on the dorsal side. Depressed ventral side. Working edge retouched from both the sides. Tang like projection on the right side margin. Fresh. Measures 3.1 cm x 2.2 cm x 0.9 cm.

Comparable to: No. 4, Pl. XVII, Brahmagiri (Seshadri, 1956).

(5)

River valley : Upper Tungabhadra (III) Site: Nyamti
Rock material: Quartz Tool type: Side scraper

Description: Made on a bladish flake. Plain dorsal and ventral sides. Working edge retouched from both the sides. Straight right side margin. Distal proximal end slightly retouched. Fresh. Measures 2.1 cm x 1.5 cm x 0.6 cm.

Comparable to: No. 6, Pl. XVI, Bangalore (Seshadri, 1956)

(6)

River valley : Bhadra (I) Site: Mattigatta
Rock material: Quartz Tool type: Side scraper

Description: Made on a thick oval shaped whitish flake. Shallow flake scars, cortexed median ridge and slopy surface on the dorsal side. Shallow flake scars on the ventral side. Convex margins retouched from both the sides. Fresh. Measures 4.6 cm x 2.2 cm x 1.3 cm.

Comparable to: No. 11, Pl. XIV, Jalahalli (Seshadri, 1956).

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(7)

River valley : Bhadra (II) Site: Holebelgal
Rock material: Quartz Tool type: Side scraper

Description: Made on a thick rectangular flake. Deep flake scar and patch and pebbble cortex on the dorsal side. Diffused bulb of percussion on the ventral side. Retouched distal working end. Fresh. Measures 3.7 cm x 3.2 cm x 1.3 cm.

Comparable to: No. 14, Pl. XVI, Bangalore (Seshadri, 1956).

(8)

River valley · Hemavati (III) Site: Kattebelguli
Rock material: Quartz Tool type: Side scraper

Description: Oval shaped, made on a thick flake. Shallow flake scars on the dorsal surface. Plain depressed ventral surface. Right side margin slightly retouched from dorsal side. Fresh. Measures 4 cm x 2.5 cm x 1 cm.

Comparable to: Varient of No. 7.

(9)

River valley : Hemavati (III) Site: Maranayakanahalli
Rock material: Quartz Tool type: Side scraper

Description: Roughly oval shaped, made on a thick flake. Shallow ripple marks on both the surfaces. Zigzag and convex left margin retouched from both the sides. Thick and straight right margin. Fresh. Measures 4.3 cm x 2.9 cm x 1.7 cm.

Comparable to: No. 1, Pl. XVII, Brahmagiri (Seshadri, 1956).

Figure II : Round scrapers

(10)

River valley : Upper Tungabhadra (I) Site: Harlahalli

Rock material: Quartz Tool type: Round scraper

Description: Made on a thick whitish flake. Shallow flake scars converging at the centre on both the dorsal and ventral sides indicate prepared core technique. Thin working edge alround. Thick at the centre. Fresh. Measures 5.7 cm x 4.8 cm x 2.5 cm.

Comparable to: No. 4, Pl. XVI, Bangalore (Seshadri, 1956).

(11)

River valley : Bhadra (II) Site· Gondi

Rock material: Milky quartz Tool type: Round scraper

Description: Made on a thick short flake. Prominent median ridge and shallow flake scars on the dorsal surface. Shallow flake scars on the ventral surface. Thin zigzag working edge alround. Thick at the centre. Fresh. Measures 2.7 cm x 2.5 cm x 1.2 cm.

Comparable to: No. 57, Fig. XXVII, Satara (Malik, 1959).

(12)

River valley : Upper Tungabhadra (III) Site: Chikbasur

Rock material: Quartz Tool type: Round scraper

Description: Made on a thick short flake. Shallow stepped flake scars on the dorsal side. Irregular flake scars and shallow flutings on the ventral side. Zigzag working edge alround due to alternate flaking. Faint mark of retouch along the periphery. Fresh. Measures 2.4 cm x 2.2 cm x 1.1 cm.

Comparable to: No. 93, Fig. 45, Nagarjunakonda (Subramanyam, 1975).

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(13)

River valley : Hemavatı (III) Site: Maranayakanahallı

Rock material: Quartz Tool type: Round scraper

Description: Made on a thick greyish flake. Shallow flake scars on both the surfaces. Zigzag working edge due to alternate flaking. Faint retouching along the edge. Fresh. Measures 3.7 cm x 3.2 cm x 1.4 cm.

Comparable to: No. 1, Pl. XVI, Bangalore (Seshadrı, 1956)

Figure III : Hollow scrapers

(14)

River valley : Upper Tungabhadra (I) Site: Konaıkanahallı

Rock material: Quartz Tool type: Hollow scraper

Description: Made on a thın elongated brownish flake. Prominent medıan ridge, two steep flake scars on the dorsal side. Plaın ventral side. Deep notch at the middle of right side margın to achieve concave working edge. Faint marks of retouch. Slightly convex near the top, flat base. Fresh. Measures 5.3 cm x 2.4 cm x 1.4 cm.

Comparable to: No. 14, Fıg. 43, Nagarjunakonda (Subramanyam, 1975).

(15)

River valley : Upper Tungabhadra (I) Site: Harlahallı

Rock material: Quartz Tool type: Hollow scraper

Description: Made on a thick whitish flake. Elongated fluted flake scars on the dorsal side. Shallow flake scars on the ventral side. Deep flake removed from the right side margın to achieve concavity and retouched from the dorsal side. Convex left side margın. Pointed base. Semı fresh. Measures 4.9 cm x 2.7 cm x 1.5 cm.

Comparable to: No. 99, Fıg. 45, Nagarjunakonda (1975).

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(16)

River valley : Upper Tungabhadra (II) Site: Surahonne

Rock material: Quartz Tool type: Hollow scraper

Description: Made on a thin pinkish flake. Prominent median ridge on the dorsal side. Plain ventral side. Concave working edge and faint traces of retouch. Distal end curved and almost pointed. Slopy base. Measures 2.4 cm x 1.5 cm x 0.6 cm.

Comparable to: No. 7, Pl. XVI, Bangalore (Seshadri, 1956).

(17)

River valley : Upper Tungabhadra (III) Site: Chikbasur

Rock material: Quartz Tool type: Hollow scraper

Description: Made on a thick flake. Prominent median ridge with slopy sides on the dorsal side. Stepped flake scars on the ventral side. Concavity on the right side margin obtained by producing a deep notch on the dorsal side. Remaining sides and the notch slightly retouched. Faceted platform. Measures 3 cm x 2.4 cm x 1.2 cm.

Comparable to: No. 6, Fig. XIV, Chembur (Malik, 1959).

Figure IV : End scraper

(18)

River valley : Upper Tungabhadra (I) Site: Konaikanahalli

Rock material: Quartz Tool type: End scraper

Description: Made on a thin brownish flake. Shallow flake scars on both the surfaces. Steep flaking of the top end to achieve thin working end. Flaring working end retouched from dorsal side. Narrow base. Fresh. Measures 3.8 cm x 2.5 cm x 0.9 cm.

Comparable to: No. 7, Pl. XIV, Jalahalli (Seshadri, 1956).

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(19)

River valley : Upper Tungabhadra (I) Site: Honnali

Rock material: Quartz Tool type: End scraper

Description: Made on a thick whitish flake. Uneven dorsal and ventral surface. Steep flaking near the top end to achieve thin working end and retouched. Thick at the base. Semi fresh. Measures 3.5 cm x 2.9 cm x 1.6 cm.

Comparable to: No. 11, Pl. XVI, Bangalore (Seshadri, 1956).

(20)

River valley : Upper Tungabhadra (III) Site: Chikbasur

Rock material: Milky quartz Tool type: End scraper

Description: Made on a short flake. Plain dorsal and ventral surfaces. Working edge retouched on the dorsal side and partially on the ventral side. Thick base. Fresh. Measures 2.5 cm x 2.1 cm x 1 cm.

Comparable to: No. 4, Pl. XIV, Jalahalli (Seshadri, 1956).

(21)

River valley: Tunga (II) Site: Hosagadde

Rock material: Milky quartz Tool type: End scraper

Description: Made on a short thick flake. Almost rectangular in shape. Prominent median ridge and slopy surface on the dorsal side. Plain ventral side. Flaring distal end retouched from dorsal side. Thick, flat base. Fresh. Measures 2.6 cm x 1.9 cm x 1.3 cm.

Comparable to: No. 6, Pl. XIV, Jalahalli (Seshadri, 1956).

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(22)

River valley : Bhadra (I) Site: Mattigatta
Rock material: Quartz Tool type: End scraper

Description: Made on a thick flake. Shallow stepped flake scars on the dorsal and ventral surfces. Broad working end at the distal end retouched from both the sides. Thick base. Fresh. Measures 2.8 cm x 1.7 cm x 1.2 cm.

Rare type.

Figure V · Scraper cum point

(23)

River valley : Upper Tungabhadra (I) Site: Hole Arlehalli
Rock material: Quartz Tool type: Scraper cum point

Description: Made on a thin flake; rectangular shaped. Three shallow flake scars and patch of cortex on the dorsal side. Plain ventral side. Retouched right margin on dorsal side. Point achieved at distal end by two small notches on the dorsal side and trimmed. Fresh. Measures 3.3 cm x 1.8 cm x 0.9 cm.

Comparable to: No. 16, Fig. XXVI, Satna (Malik, 1959).

(24)

River valley : Upper Tungabhadra (III) Site: Haraganahalli
Rock material: Quartz Tool type: Scraper cum point
Description: Made on a thick greyish flake. Shallow flake scars and prominent mid ridge along the longer axis on the dorsal side. Step flake scars on the ventral side. Retouched side margins. A small flake removed obliquely near the distal end on the left side margin to obtain working point and retouched. Thick at the bottom and straight base. Fresh. Measures 5 cm x 4.8 cm x 2.2 cm.

Comparable to: No. 9, Pl. XV, Bangalore (Seshadri, 1956).

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(25)

River valley : Upper Tungabhadra (III) Site: Chikbasur

Rock material: Quartz Tool type: Scraper cum point

Description: Made on a thick flake. Irregular in shape. Shallow slopy flake scars and median ridge on the dorsal side. Flat and plain ventral surface. Margins retouched alround from both the sides, including the tip. Fresh. Measures 3 cm x 1.9 cm x 0.8 cm.

comparable to: No. 18, Fig. XXV, Mahabaleshwar (Malik, 1959).

Figure VI : Asymmetric point

(26)

River valley : Upper Tungabhadra (I) Site: Hanagawadi

Rock material: Quartz Tool type: Asymmetric point.

Description: Made on a thin flake. Steep flake scar and patch of cortex on the dorsal side. Plain ventral side. Oblique flaking near the distal end to achieve point. Retouched tip. Fresh. Measures 3.5 cm x 2.4 cm x 0.9 cm.

Comparable to: No. 6, Pl. XVII, Brahmagiri (Seshadri, 1956).

(27)

River valley : Upper Tungabhadra (I) Site: Hanagavadi

Rock material: Quartz Tool type: Asymmetric point

Description: Made on a thin elongated flake. Shallow flake scars on both the surfaces. Working end on either side achieved by removing flakes, obliquely from side margins. Slightly convex right side margin. Fresh. Measures 5.5 cm x 2.6 cm x 1 cm.

Comparable to: No. 44, Fig. 42, Nagarjunakonda (Subramanyam, 1975).

(28)

River valley : Upper Tungabhadra (I) Site: Konaikanahalli

Rock material: Quartz Tool type: Asymmetric point

Description: Made on a thin flake. Two deep notches on the right side margin producing serrated edge. Plain dorsal and ventral sides. Convex right margin and curved near the top. Fresh. Measures 4 cm x 2.6 cm x 1.1 cm.

Rare type.

(29)

River valley : Upper Tungabhadra (II) Site: Haraganahalli

Rock material: Quartzite Tool type: Asymmetric point

Description: Made on a thick brownish flake. Triangular shaped. Shallow flake scars on the dorsal side. Bulb of percussion nipped on the ventral side. Cortexed platform near the base. Narrow pointed end achieved by producing a notch near the tip on the right side margin. Patch of cortex at the base. Fresh. Measures 2.9 cm x 2.5 cm x 1.7 cm.

Comparable to: No. 3, Pl. XVII, Brahmagiri (Seshadri, 1956).

(30)

River valley: Upper Tungabhadra (II) Site: Salabalu

Rock material: Quartz Tool type: Asymmetric point

Description: Made on a thick whitish flake. Numerous ripple marks on the dorsal and ventral sides. Faceted platform on the left side margin. Remaining sides retouched. Two thin flakes removed from the distal end to obtain woking point. Fresh. Measures 2.3 cm x 2.2. cm x 0.8 cm.

Comparable to: No. 19, Fig. XIII, Bombay (Malik (1959).

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(31)

River valley : Upper Tungabhadra (III) Site: Chikbasur

Rock material: Quartz Tool type: Asymmetric point

Description: Made on a thick narrow bladish flake. Shallow flutings on the dorsal side. Stepped flake scars on the ventral side. Both the margins and the tip retouched. Flat base. Fresh. Measures 2.3cm x 1.6 cm x 0.9 cm.

Comparable to: No. 41, Fig. XIX, Mahuli (Malik, 1959).

(32)

River valley : Bhadra (I) Site: Mattigatta

Rock material: Quartz Tool type· Asymmetric point

Description: Irregular shaped, made on a thick flake. Shallow step flake scars on the dorsal and ventral surfaces. Oblique stroke on the right side margin to produce point. Left side margin retouched from midle towards tip end. The remaining portion obliquely cut. Fresh. Measures 3.3 cm x 2.5 cm x 1.00 cm.

Comparable to: No. 26, Pl. XIII, Jalahalli (Seshadri, 1956).

(33)

River valley : Bhadra (II) Site: Kagikodumagge

Rock material: Rock crystal Tool type: Asymmetric point

Description: Made on a narrow thick flake. Rectangular in shape; uneven dorsal surface. Plain ventral surface. Two oblique strokes near the distal end to produce point and retouched from ventral side. Fresh. Measures 2 cm x 1.8 cm x 0.7 cm.

Comparable to: No. 42, Pl. XIII, Jalahalli (Seshadri, 1956).

(34)

River valley : Tunga (III) Site: Sirgala

Rock material: Rock crystal Tool type: Asymmetric point

Description: Made on a short thick flake. Numerous shallow flake scars on the upper half and patch of pebble cortex on the lower half of dorsal side. Shallow flutings and flake scars on the ventral surface. A shallow notch at the distal end along the left margin. Working point retouched from all sides. Fresh. Measures 2.1 cm x 1.9 cm x 0.8 cm.

Comparable to: No. 18, Fig. XVI, Vajreshwari (Malik, 1959).

(35)

River valley : Hemavati (III) Site Maranayakanahalli

Rock material: Quartz Tool type· Asymmetric point

Description: Made on a thin elongated bladish flake. Median ridge running along the longer axis and the side slopes towards the margins on the dorsal surface. Depressed ventral surface. Oblique-flaking along the margin at the distal end. A small notch near the base to produce tang. Point tip short and thick. Fresh. Measures 3.7 cm x 1.9 cm x 0.7 cm.

Comparable to: No. 5, Pl. XVII, Brahmagiri (Seshadri, 1956).

(36)

River valley · Hemavati (III) Site: Cholenahalli

Rock material: Quartz Tool type· Asymmetric point

Description: Made on thin flake. Patch of pebble cortex on the upper half and ripple marks on the lower half of dorsal surface. Ripple marks on the ventral surface. Small notch at the pointed distal end. Right margin slightly convex and straight left margin. Thick near the base. Fresh. Measures 2.6 cm x 1.5 cm x 0.7 cm.

Comparable to: No. 14, Pl. XV, Bangalore (Seshadri, 1956).

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Figure VII : Symmetric point

(37)

River valley : Upper Tungabhadra (I) Site: Honnali

Rock material: Quartz Tool type: Symmetric point

Description: Leaf shaped; made on thick pinkish flake. Shallow flake scars on the dorsal side. Bulb of percussion on the ventral side. Flakes removed obliquely near the distal end to achieve point. Slight retouching of side margins. Prominent median ridge. Round base. Fresh. Measures 4.5 cm x 3.5 cm x 1.5 cm.

Comparable to: No. 50, Fig. 19(a), Renigunta (Murthy, 1970).

(38)

River valley : Upper Tungabhadra Site: Hanagavadi

Rock material: Milky quartz Tool type: Symmetric point

Description: Leaf shaped; made on a thin flake. Shallow flake scars on both the surfaces. Side margins retouched to attain point at distal end. Broken point. Flat base. Fresh. Measures 3.5 cm x 3 cm x 1.1 cm.

Comparable to: No. 28, Fig. XXI, Wai (Malik, 1959).

(39)

River valley : Upper Tungabhadra (II) Site: Salabalu

Rock material: Quartz Tool type: Symmetric point

Description: Leaf shaped point; made on a short thick whitish flake. Few ripple marks on the dorsal side. Plain ventral side. Retouched convex side margins. Broken point. Measures 2.2 cm x 1.7 cm x 0.8 cm.

Comparable to: No. 27, Fig. XXI, Wai (Malik, 1959).

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(40)

River valley : Upper Tungabhadra (III) Site: Nyamti

Rock material: Quartz Tool type: Symmetric point

Description: Made on a thin flake. Shallow flutings and few flake scars on both the ventral and dorsal sides. Point obtained by oblique stroke from one margin and retouched. Faint projection at the base. Incipient notch on the other margin appears like tang. Fresh. Measures 2.7 cm x 2.2 cm x 0.9 cm.

Comparable to: NO. 6, Fig. XIII, Bombay (Malik, 1959)

(41)

River valley : Upper Tungabhadra (III) Site: Chikbasur

Rock material: Quartz Tool type: Symmetric point

Description: Made on a short thick flake. Shallow stepped flutings and ridge on the dorsal side. Flat and plain ventral side. Minute retouching of margins from both the sides. Broken tip. Measures 2.1 cm x 1.5 cm x 0.9 cm.

Comparable to: No. 23, Pl. XV, Bangalore (Seshadri, 1956).

(42)

River valley : Bhadra Site: Mattigatta

Rock material: Milky quartz Tool type: Symmetric point

Description· Triangular shaped, made on a thick broad flake. Flaking done from the middle on the dorsal side slopes towards the tip. Shallow flake scars and median ridge on the ventral surface. Two shallow notches at the middle on either margins to obtain broad and thin point. Margins retouched from both the sides. Partially straight left side margin. Flat base. Fresh. Measures 2.9 cm x 2.6 cm x 1 cm.

Rare type.

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(43)

River valley : Bhadra (I) Site: Mattigatta

Rock material: Rock crystal Tool type: Symmetric point

Description: Triangular shaped; made on a thin flake. Uneven dorsal and ventral surfaces. Margins retouched alround. Uneven notches on the dorsal side at the distal end. Retouched tip. Round base. Fresh. Measures 2.8 cm x 1.8 cm x 0.8 cm.

Rare type.

(44)

River valley : Tunga (III) Site· Mandagadde

Rock material: Milky quartz Tool type· Symmetric point

Description: Made on a thick flake. Triangular shaped. Zigzag ridge running along the longer axis on the dorsal side. Nipped, diffused bulb of percussion on the ventral side. Thin convex right margin slightly retouched. Left margin thick near the base. Fresh. Measures 3.2 cm x 2.8 cm x 1. 2 cm.

Comparable to: NO. 49, fig. XXII, Wai (Malik, 1959).

(45)

River valley : Hemavati (III) Site: Kattebelguli

Rock material: Quartz Tool type: Symmetric point

Description: Made on a thick flake; triangular shaped. Ripple marks and protrusion on the dorsal surface. Nipped bulb of percussion on the ventral surface. Platform on the right margin. Slightly retouched left margin. Thin point. Thick at the centre. Fresh. Measures 3.7 cm x 3 cm x 1.5 cm.

Comparable to: no. 35, Fig. 59(a), Bangaltota (Sankalia, 1974).

(46)

River valley : Hemavatı (III) Sıte: Mudalahıppe

Rock material: Rock crystal Tool type: Symmetrıc poınt

Descriptıon: Made on a short thıck flake; triangular shaped. Pebble cortex patch along the left margın and rıpple marks ın the remaınıng portıon on the dorsal surface. Small bulb of percussıon on the ventral surface. Oblıque strokes from opposıte margıns to attaın workıng poınt. Short and thıck tıp. Faınt retouchıng along the margın. Narrow base indıcates tang. Fresh. Measures 2.6 cm x 2 cm x 0.8 cm.

Figure VIII : Borer

(47)

River valley : Upper Tungabhadra (I) Sıte: Hole Arlehallı

Rock materıal: Quartz Tool type: Borer

Descrıptıon: Made on a thıck flake; almost trıangular ın shape. Workıng end achıeved at the middle of longer axıs by producıng two deep notches on the dorsal sıde. Shallow scars on the ventral sıde. Flat base. Fresh. Measures 4.8 cm x 2.4 cm x 1.2 cm.

Rare type.

(48)

River valley : Upper Tungabhadra (III) Sıte· Nyamtı

Rock materıal: Quartz Tool type: Borer

Descrıptıon: Made on a small thin flake. Shallow flake scars and short rıdge on the dorsal side. Plain ventral surface. Borer point obtaıned by producıng a deep notch at the dıstal end on the rıght sıde margın. Retouched tıp. Fresh. Measures 2 cm x 1.3 cm x 0.6 cm.

Comparable to: No. 6, Fıg. 20, Renıgunta (Murthy, 1970).

396

(49)

River valley : Bhadra (I) Site: Mattigatta

Rock material: Quartz Tool type: Borer

Description: Made on a thin flake. Medial ridge and slopy surface on the dorsal side. Flat and plain ventral side. Borer tip obtained by producing notches at the middle of the longer axis. Retouched tip. Fresh. Measures 3.1 cm x 1.7 cm x 0.6 cm.

Variation of No. 47.

(50)

River valley : Tunga (III) Site: Mandagadde

Rock material: Quartz Tool type: Borer

Description: Made on a thick bladish flake. Numerous flutings and central ridge running along the longer axis on the dorsal side. Shallow ripples on the ventral side. Faceted platform on the right margin. Borer point attained by removing a spall vertically and retouched from all the sides. Uneven base. Fresh. Measures 3.5 cm x 1.9 cm x 1.1 cm.

Comparable to: No. 47, Pl.XIII, Jalahalli (Seshadri, 1956).

(51)

River valley : Hemavati (III) Site: Maranayakanahalli

Rock material: Quartz Tool type: Borer

Description: Made on a bladish flake; rectangular in shape. Shallow fluting marks and low ridges on the dorsal surface. Depressed ventral surface. Borer point at the distal end achieved by a deep notch along the left margin. Protruding thin working end retouched from all sides. Fresh. Measures 2.9 cm x 2.1 cm x 0.6 cm.

Comparable to: No. 29, Fig. XXIV, Mahabaleshwar (Malik, 1959).

(52)

River valley : Tunga (II) Site: Hosagadde

Rock material: Quartzite Tool type: Borer

Description: Made on a bladish flake, grey in colour. Fluting marks on the protruded dorsal side. Bulb of percussion nipped on the ventral surface. Working end attained by removing a flake vertically along the right margin at the distal end. Flat cortexed base. Fresh. Measures 2.4 cm x 1.7 cm x 0.8 cm.

Comparable to: No. 9, Fig. 20, Renigunta (Murthy, 1970).

Figure IX : Backed blade

(53)

River valley : Upper Tungabhadra (I) Site: Harlahalli

Rock material: Quartz Tool type: Backed blade

Description: Almost triangular shaped, made on a thin pinkinsh blade. Plain dorsal and ventral sides. Straight working margin. Other convex margin blunted with numerous shallow flake scars. Fresh. Measures 2.5 cm x 1.5 cm x 0.8 cm.

Comparable to: No. 25, Pl. XIII, Jalahalli (Seshadri, 1956).

(54)

River valley : Upper Tungabhadra (III) Site: Chikbasur

Rock material: Quartz Tool type: Backed blade

Description: Made on a short thin greyish blade. Depressed dorsal and ventral surfaces. Thin working edge obtained by fluting the margin and retouched. Convex margin blunted carefully by removing small chips by pressure technique. Fresh. Measures 2.3 cm x 1.9 cm x 0.6 cm.

Rare type.

... 398

(55)

River valley : Upper Tungabhadra (III) Site: Nyamti

Rock material: Quartz Tool type: Backed blade.

Description: Triangular shaped. Shallow flake scar on the ventral side, slopy dorsal surface. Thin cutting edge with notches show use mark. Convex margin blunted by removing small flakes. Fresh. Measures 2.6 cm x 1.4 cm x 0.7 cm.

Comparable to: No. 7, Fig. XXV, Mahabaleshawar (Malik, 1959).

(56)

River valley : Bhadra (I) Site: Mattigatta

Rock material: Milky quartz Tool type: Backed blade

Description: Made on a short thick blade. Rough retouch sloping towards the working edge on the dorsal side. Convex margin blunted by removing small flakes. Narrow distal end. Broad in the middle. Flat straight base. Fresh. Measures 2.1 cm x 1.6 cm x 0.6 cm.

Comparable to: Variation of 54.

(57)

River valley : Bhadra (II) Site: Malenahalli

Rock material: Milky quartz Tool type: Backed blade

Description: Rectangular shaped; medium size. Shallow flutings and low ridge on the dorsal surface. Depressed ventral surface. Working margin straightly concave at the centre and retouched from dorsal side. Convex margin blunted by close chipping. Fresh. Measures 2.4 cm x 1.1 cm x 0.4 cm.

Comparable to: No. 8, Fig. XXVI, Ambenalli - Joali (Malik, 1959).

(58)

River valley : Bhadra (II) Site· Malenahallı

Rock material: Quartz Tool type· Backed blade

Description: Rectangular shaped; medium size. Flutings and ridge running along the concave working margin on the dorsal surface. Depressed ventral surface. Working margin retouched from the dorsal side. convex margin blunted by chipping. Thick base. Fresh. Measures 3.4 cm x 1.5 cm x 1.1 cm.

Comparable to· Variation of No. 57.

(59)

River valley : Tunga (III) Site: Mandagadde

Rock material: Quartz Tool type: Backed blade

Description: Made on a thick long blade. Slopy dorsal side. Depressed ventral surface. Thin and sharp. Concave working margin. Convex margin is blunted by steep flaking. Fresh. Measures 3.3 cm x 1.7 cm x 1 cm.

Comparable to: No. 17, Fig. XXV, Mahabaleswar (Malik, 1959).

(60)

River valley : Hemavatı (III) Site: Maranayakanahallı

Rock material: Quartz Tool type Backed blade

Description: Made on thin blade. Ridge along the convex margin and slopy working margin on the dorsal surface. Working edge straight and slight retouched. Convex margin blunted by irregular step flaking. Fresh. Measures 3.6 cm x 2 cm x 0.7 cm.

Comparable to: Variation of No. 55.

... 400

Plate X : Point on blade

(61)

River valley : Upper Tungabhadra (I) Site: Haralahalli

Rock material: Quartz Tool type: Point on blade

Description: Triangular shaped, made on a thin short blade. Fluted scars on the dorsal side. Ripple marks on the ventral side. Point achieved by producing a notch near the distal end retouched. Slight retouching of the side margins. Fresh. Measures 1.7 cm x 1.3 cm x 0.6 cm.

Rare type.

(62)

River valley : Upper Tungabhadra (I) Site: Haralahalli

Rock material: Quartz Tool type: Point on blade

Description: Made on a short blade. Flutings on the dorsal side. Plain ventral side. Working end achieved by producing irregular notches on either side of the margin. Fresh. Measures 1.8 cm x 1.6 cm x 0.7 cm.

Comparable to: No. 7, Fig. 3, Malampuzha (Rajendran, 1985).

(63)

River valley : Bhadra (I) Site· Mattigatta

Rock material: Quartz Tool type: Point on blade

Description: Made on a short thick blade. Shallow flutings and two slopy notches at the distal end on the dorsal side. Depressed ventral surface. Tip retouched. Fresh. Measures 2.2 cm x 1.4 cm x 0.6 cm.

Comparable to: No. 43, Fig. XXIII, Panchgani Road (Malik, 1959).

... 401

(64)

River valley : Bhadra (II) Site: Holebelgal

Rock material: Quartz Tool type: Point on blade

Description: Point made on a short blade. Prominent median ridge and slopy dorsal surface. Shallow flutings on the ventral surface. Thick long point retouched from all sides. Triangular section. Fresh. Measures 2.1 cm x 1.2 cm x 0.6 cm.

Comparable to: No.42, Pl. XIII, Jalahalli (Seshadri, 1956).

(65)

River valley : Tunga (II) Site: Sulebailu

Rock material: Quartz Tool type: Point on blade

Description: Small point made on a thick short blade. Median ridge and fluting marks on the dorsal surface. Depressed ventral surface. Working margin retouched from ventral surface. Fresh. Measures 1.6 cm x 1.2 cm x 0.7 cm.

Comparable to: No. 10, Fig. XXIII, Panchgani Road (Malik, 1959).

(66)

River valley : Tunga (III) Site: Mandagadde

Rock material: Quartz Tool type: Point on blade

Description: Crescent shaped point made on a thin short blade. Shallow flutings on the dorsal surface. Plain ventral surface. Straight left margin. Convex right margin retouched obliquely at the distal end. Thin and sharp point. Fresh. Measures 2 cm x 1.3 cm x 0.4 cm.

Comparable to: No. 9, Fig. 2, Podippara (Rajendran, 1985).

... 402

Figure XI : Simple blade

(67)

River valley : Upper Tungabhadra (II) Site: Surahonne

Rock material:Quartz Tool type: Simple blade

Description: Rectangular shaped, made on a short thick blade. Flutings on both the surfaces. Straight left margin shows wear and tear. Convex right margin. Thick at the centre. Fresh. Measures 2.2 cm x 1.2 cm x 0.8 cm.

Comparable to: No 95, Fig. 45, Nagarjunakonda (Subramanyam, 1975).

(68)

River valley : Upper Tungabhadra (III) Site: Sasivehalli

Rock material: Quartz Tool type: Simple blade

Description: A short and thin blade. Central ridge and slopy surface on the dorsal side. Small bulb of percussion on the ventral side. Plain platform. Margins almost straight and thin. Fresh. Measures 2 cm x 1.3 cm x 0.6 cm.

Comparable to: Variation of 67.

(69)

River valley : Upper Tungabhadra (III) Site: Nyamti

Rock material: Quartz Tool type: Simple blade

Description: Short and thick blade. Shallow flutings on the dorsal side. Depression on the ventral surface. Almost straight margins. Small strip of cortex retained along the left margin. Broad base. Fresh. Measures 2 cm x 1.9 cm x 0.6 cm.

Comparable to: No. 9, Fig. XVII, Mahuli (Malik, 1959).

... 403

(70)

River valley : Bhadra (I) Site: Mattigatta

Rock material: Quartz Tool type: Simple blade

Description: Parallel sided blade. Flutings on the dorsal surface. Depressed ventral surface. Thin left margin. Thick and blunt right side margin. Fresh. Measures 2.1 cm x 1.1 cm x 0.4 cm.

Comparable to: No. 3, Fig. XIII, Bombay (Malik, 1959).

(71)

River valley : Bhadra (I) Site: Dasarakallahalli

Rock material: Quartz Tool type: Simple blade

Description: Rectangular shaped; low median ridge and flutings on the dorsal surface. Bulb of percussion on the ventral surface. Faceted platform. Concave left side margin; convex right side margin. Fresh. Measures 2.4 cm x 1.1 cm x 0.5 cm.

Comparable to: Variation of 70.

(72)

River valley : Tunga (II) Site: Hosagadde

Rock material: Quartzite Tool type: Simple blade

Description: Made on a greysih flake. Flutings on the dorsal surface. Bulb of percussion on the ventral surface. Thin parallel sided margins. Fresh. Measures 1.6 cm x 1.4 cm x 0.6 cm.

Comparable to: Variation of 69.

... 404

(73)

River valley : Tunga (II) Site: Tirthahalli

Rock material: Milky quartz Tool type: Simple blade

Description: Rectangular shaped; flutings on the dorsal side. Plain ventral surface. Broad parallel sided margins. Slightly retouched narrow distal end. Fresh. Measures 1.9 cm x 1.4 cm x 0.4 cm.

Comparable to: No. 5, Fig. XIV, Chembur (Malik, 1959).

(74)

River valley : Hemavati (III) Site: Maranayakanahalli

Rock material: Quartz Tool type: Simple blade

Description: Rectangular shaped; made on a thick blade. Prominent median ridge and flake scars slopings towards the margin on the dorsal surface. Uneven ventral surface. Thin margins slightly convex near the base and top end respectively. Fresh. Measures 3.2 cm x 1.8 cm x 0.9 cm.

Comparable to: No. 103, Fig. 45, Nagarjunakonda (Subramanyam, 1975).

... 405

Figure NO. XII : Core

(75)

River valley : Bhadra (I) Site· Mattigatta

Rock material: Milky quartz Tool type· Core

Description: Roughly cylindrical shaped. Shallow short fluting marks on all the sides. Platforms slanting towards one side. Measures 2.3 cm (length) x 1.6 cm (thickness)

(76)

River valley : Bhadra (II) Site· Dasarakallahalli

Rock material: Quartz Tool type: Core

Description: Nearly cylindrical in shape with conical tip. Has flutations alround and the base slanting obliquely. Measures 2.8 cm x 1.8 cm.

... 406

(77)

River valley : Bhadra (II) Site: Malenahalli

Rock material: Quartz Tool type: Core

Description: Medium sized; rectangular in shape. Flutings all over the surface and both the ends are almost flat. Measures 2.9 cm x 1.4 cm.

(78)

River valley : Hemavati (III) Site: Maranayakanahalli

Rock material: Quartz Tool type: Core

Description: Cylindrical shaped. Numerous fluting marks and patch of pebble cortex on the upper surface. Platform at the top. Broad and flat base. Measures 4.2 cm x 3.4 cm.

... 407

Figure No. XIII - Tool types found only in the I category sites in the Upper Tungabhadra valley
(Scrapers and Discoid)

(79)

River valley : Upper Tungabhadra (I) Site: Konaikanahalli
Rock material: Quartz Tool type: Cortexed side scraper

Description: Almost triangular in shape; made on a thin flake. Patch of a cortex and few shallow flake scars on the dorsal side. Plain ventral side. Retouched margin. Fresh. Measures 4 cm x 2.2 cm x 1.1 cm.

Comparable to: No. 2, Fig. 3, Mallampuzha (Rajendran, 1975)

(80)

River valley : Upper Tungabhadra (I) Site: Honnali
Rock material: Quartz Tool type: Thumb nail scraper

Description: Made on a thick rectangular flake of pinkish colour. Shallow flake scars on both the surfaces. Flat surface achieved by removing circular flake on the dorsal side for thumb grip. Broad retouched distal working end. Thick at the base. Fresh. Measures 3.5 cm x 2.6 cm x 1.6 cm.

Comparable to: No. 17, Fig. XIII, Bombay (Malik, 1959).

(81)

River valley: Upper Tungabhadra Site: Hanagawadi
Rock material: Quartz Tool type: Thumb nail scraper

Description: Rectangular shaped; made on a thick flake. Shallow slopy flake scars and prominent median ridge on the dorsal surface. Plain ventral surface. Thick and convex left margin. Straight right margin retouched from both the sides. Steep flaking near the working end on the dorsal side for thumb hold. Fresh. Measures 4.2 cm x 3 cm x 2.1 cm.

Comparable to: No. 15, Pl. XVI, Bangalore (Seshadri, 1956).

... 408

(82)

River valley : Upper Tungabhadra (I) Site: Hole Arlehalli

Rock material: Quartz Tool type: Double sided scraper

Description: Made on a thin flake of pinkish colour. Rectangular shaped. Shallow flake scars on the dorsal side. Nipped bulb of percussion on the ventral surface. Retouched margins. Plain platform. Semi-fresh. Measures 2.8 cm x 2.6 cm x 0.9 cm.

Comparable to: No. 9, Pl. XIV, Jalahalli (Seshadri, 1956)

(83)

River valley : Upper Tungabhadra (I) Site: Honnali

Rock material: Quartz Tool type: Double sided scraper

Description: Made on a thick pinkish flake. Rectangular shaped; prominent ridge and shallow flake scars on the dorsal side. Nipped bulb of percussion on the ventral side. Plain platforms. Retouched zigzag working edge on both the sides due to alternate flaking. Fresh. Measures 3.8 cm x 3.5 cm x 1.5 cm.

Comparable to: No. 13, Pl. XIV, Jalahalli (Seshadri, 1956)

(84)

River valley : Upper Tungabhadra (I) Site: Hanagavadi

Rock material: Quartz Tool type: Discoid

Description: Made on a thick flake; oval shaped. Pressure flake scars on both the surfaces. Thin and slightly zigzag periphery alround. Thick at the centre. Pointed base. Fresh. Measures 4.4 cm x 3.2 cm x 1.8 cm.

Rare type.

... 409

Figure XIV : Tool types found in the II category sites only

(85)

River valley : Bhadra (II) Site: Malenahalli

Rock material: Milky quartz Tool type: Burin

Description: Made on a thick short blade. Fluting marks and slopy margins on the dorsal side. Plain ventral surface. Working point achieved by removing a spall vertically at the distal end along the right margin and retouched. Fresh. Measures 2.3 cm x 1.4 cm x 0.7 cm.

Comparable to: No. 8, Fig. 20, Around Renigunta (Murthy, 1970).

(86)

River valley : Tunga (II) Site: Sringeri

Rock material: Quartz Tool type: Core point

Description: Made on a short cylindrical shaped core. Ridges and fluting marks all over the surface. Pointed distal end. Flat base. Fresh. Measures 2.1 cm x 1.2 cm x 1.2 cm.

Comparable to: No. 65, Pl. XIII, Jalahalli (Seshadri, 1956)

(87)

River valley : Upper Tungabhadra (II) Site. Surahonne

Rock material: Quartz Tool type: Transverse arrow head

Description: Made on a thin flake, plain surface. Thin and broad working end is made on the dorsal side. Both the convex side margins retouched and converge at the base to form a small tang for hafting. Fresh. Measures 2.3 cm x 1.8 cm x 0.5 cm.

Comparable to: No. 3, Fig. XIII, Jalahalli (Seshadri, 1956)

... 410

Figure XV : Tool types common to II and III category sites

(a) Side End scraper

(88)

River valley : Upper Tungabhadra (I) Site:Konaikanahalli

Rock material: Quartz Tool type: Side End scraper

Description: Irregular 'U' shaped; made on a thick flake. Shallow flake scars on both the surfaces. Steep flaking to achieve thin working edge on the dorsal side. Flat ventral surface. Prominent protrusion on the dorsal side. Minute retouching of the working edge. Straight bottom. Fresh. Measures 4.1 cm x 3.1 cm x 1.9 cm.

Comparable to: No. 8, Pl. XIV, Jalahalli (Seshadri, 1956).

(89)

River valley : Upper Tungabhadra (II) Site: Haraganahalli

Rock material: Quartzite Tool type: Side end scraper

Description: 'U' shaped; made on a thick brownish flake. Shallow flake scars converging at the centre on the dorsal side indicates prepared core technique. Portion of cortex retained on the dorsal side. Deep flake scar near the right side margin on the ventral side. Flat base and zigzag working end. Fresh. Measures 4.1 cm x 2.9 cm x 1.4 cm.

Comparable to: No. 13, Fig. 3, Mallampuzha (Rajendran, 1985)

(90)

River valley : Upper Tungabhadra (II) Site: Salabalu

Rock material: Quartz Tool type: Side end scraper

Description: Roughly 'U' shaped; made on a thick whitish flake. Numerous fluting marks on the upper surface and along the three margins on the dorsal side. Retouched margins. Flat ventral side. Fresh. Measures 2.1 cm x 1.8 cm x 0.9 cm.

comparable to: No. 14, Pl. XIV, Jalahalli (Seshadri, 1956)

(91)

River valley : Upper Tungabhadra (II) Site: Surahonne

Rock material: Milky quartz Tool type: Side end scraper

Description: 'U' shaped; made on a thick flake. Shallow flake scars converging at the middle on the dorsal side and flutings on the ventral side. Prominent median ridge. Working end slightly retouched on three sides. Thick at the centre. Flat base. Fresh. Measures 2.7 cm x 2.3 cm x 1.7 cm.

Comparable to: No. 11, Pl. XIV, Bangalore (Seshadri, 1956)

(92)

River valley : Bhadra (II) Site: Malenahalli

Rock material: Quartz Tool type: Side end scraper

Description: 'U' shaped; made on a thick flake, shallow flake scars on the dorsal side. Numerous ripple marks on the ventral surface. Thin working end retouched from the dorsal side all along the margin. Prominent ridge along the slopy left side margin. Thin coat of blackish patina on both the surfaces. Broad base. Fresh. Measures 4.2 cm x 2.8 cm x 1.3 cm.

Comparable to: Variation of No. 89.

(93)

River valley: Bhadra (II) Site: Holebelgal

Rock material: Quartz Tool type: Side end scraper

Description: Roughly rectangular in shape; made on a thick flake. Shallow flake scars on the dorsal surface. Depressed ventral surface. Side margins and distal end retouched from both the sides. Convex left margin. Concave right margin. Fresh. Measures 4.3 cm x 3.5 cm x 1.3 cm.

Comparable to: No. 19, Pl. XIV, Jalahalli (Seshadri, 1956).

... 412

Figure XV(b) : Core scrapers

(94)

River valley : Upper Tungabhadra (I) Site: Hanagavadi

Rock material: Quartz Tool type: Core scraper

Description: Irregular shaped; made on a thick pinkish core. Steep fluted scars on the dorsal side. Flat and plain ventral side. Zigzag working edge. Fresh. Measures 3.6 cm in length and 2.2 cm in thickness.

Comparable to: No. 1, Fig. 3, Mallampuzha (Rajendran, 1985).

(95)

River valley : Upper Tungabhadra (II) Site: Surahonne

Rock material: Quartz Tool type: Core scraper

Description: Sub-triangular in shape; made on a cylindrical core. Three to four fluted marks on the dorsal side and three on the ventral side. Pointed tip. Left side working margin slightly convex at the distal end. Flat platform. Fresh. Measures 2.4 cm x 1.7 cm x 1 cm.

Comparable to: No. 65, Pl. XIII, Jalahalli (Seshadri, 1956)

Figure XVI : Tool types common to II and III category

(a) Crescentic point

(96)

River valley : Tunga (II) Site: Tirthamattur

Rock material: Quartz Tool type: Crescentic point

Description: Made on a short bladish flake of grey colour. Triangular shaped. Numerous shallow flake scars on the slopy dorsal surface. Fluting marks and flake scar near the tip on the ventral surface. Retouched convex left side margin, converges at the working end. Straight base. Fresh. Measures 2 cm x 1.4 cm x 0.7 cm.

Comparable to: No. 31, Pl. XIII, Jalahalli (Seshadri, 1956).

(97)

River valley : Tunga (II) Site: Sringeri

Rock material: Quartz Tool type: Crescentic point

Description: Made on a thin narrow blade. Leaf shaped. Low central ridge along the longer axis, on the dorsal side. The two sides meet at narrow distal end. The arc is blunted by close chipping of flakes. Thin and sharp tip. Broad base. Fresh. Measures 1.8 cm x 0.8 cm x 0.4 cm.

Comparble to: No. 21, Fig. 59, Tinnevelly (Sankalia, 1975).

(98)

River valley : Tunga (III) Site: Mandagadde

Rock material: Quartz Tool type: Crescentic point

Description: Made on a thick bladish flake. Prominent median ridge and slopy shallow flake scars on the dorsal side. Flake scars and numerous ripples on the ventral surface. Convex, thin left margin. Straight right margin blunted by retouching from the ventral side. Broad, thin and retouched point. Fresh. Measures 3.4 cm x 2.4 cm x 0.9 cm.

Comparable to: No. 14, Fig. 3, Mallampuzha (Rajendran, 1985).

(99)

River valley : Tunga (III) Site: Sirgala

Rock material: Quartz Tool type: Crescentic point

Description: Made on a thick bladish flake. Shallow flake scars on both the surfaces. Retouched and thin convex left margin. Point attained by producing a shallow notch at the distal end and retouched. Thick at the centre. Fresh. Measures 3.5 cm x 2.5 cm x 1.1 cm.

Comparable to: Variation of No. 98.

... 414

Figure XVI (b): Tanged point

(100)

River valley : Upper Tungabhadra (I) Site: Konaikanahalli

Rock material: Milky quartz Tool type: Tanged point

Description: Made on a thick flake. Numerous shallow flake scars and prominent median ridge on the dorsal side. Steep flake scars on the ventral side. Slight retouch of side margins and tip. Two deep notches near the base to achieve tang. Thick at the centre. Fresh. Measures 7.5 cm x 4.4 cm x 3.3 cm.

Comparable to: No. 14, Pl. XV, Bangalore (Seshadri, 1956).

(101)

River valley : Upper Tungabhadra (III) Site: Nyamti

Rock material: Quartz Tool type: Tanged point

Description: Made on a short thick flake. Triangular in shape. Irregular shallow flutings on the dorsal and ventral sides. Retouched margins and slightly curved tip. Tanged base. Fresh. Measures 2 cm x 1 cm x 0.7 cm.

(102)

River valley : Tunga (II) Site: Sulebailu

Rock material: Quartz Tool type: Tanged point

Description: Made on a bladish flake. Fluting marks and ridges on the dorsal surface. Nipped bulb of percussion on the ventral side. Both the margins worked from middle to converge at the distal pointed end. A deliberate notch at theproximal end near the left margin to produce a tang and retouched. Fresh. Measures 2.8 cm x 1.8 cm x 0.6 cm.

Comparable to: No. 11, Fig. XXIII, Panchgani (Malik, 1959).

(103)

River valley : Tunga (II) Site: Tirthamattur

Rock material: Milky quartz Tool type: Tanged point

Description: Made on a bladish flake. Slopy and short ridge on the dorsal surface. Shallow flake scars on the ventral surface. Oblique strokes to attain point at the distal end. Narrow convex left side margin; tang. Fresh. Measures 2.6 cm x 1.7 cm x 0.8 cm.

Comparable to: No. 64, Fig. 44, Nagarjunakonda (Subramanyam, 1975).

Figure XVI(c) : Bladish flake

(104)

River valley : Bhadra (II) Site: Dasarakalhalli

Rock material: Quartz Tool type: Bladish flake

Description: Roughly rectangular in shape. Low uneven central ridge and shallow flutings on the dorsal surface. Depressed uneven ventral surface. Use marks on the thin side margins. Faceted platform. Fresh. Measures 2.5 cm x 2 cm x 0.8 cm.

Rare type.

(105)

River valley : Bhadra (II) Site: Malenahalli

Rock material: Quartz Tool type· Bladish flake

Description: Rectangular shaped. Faint flutings on the dorsal side. Numerous ripple marks on the ventral surface. Straight left side working margin. Convex right side margin. Working margin retouched from the dorsal side. Faceted platform broken in a corner. Fresh. Measures 2 cm x 1.3 cm x 0.7 cm.

Rare type.

... 416

(106)

River valley : Tunga (II) Site: Sulebailu

Rock material: Rock crystal Tool type: Bladish flake

Description: Roughly oval in shape. Low central ridge and patch of cortex on the dorsal side. Shallow ripples on the ventral surface. Thin margin retouched on the dorsal side. Fresh. Measures 3.5 cm x 2.5 cm x 0.9 cm.

Rare type.

(107)

River valley : Hemavati (III) Site: Cholenahalli

Rock material: Quartz Tool type: Bladish flake

Description: Rectangular shaped. Prominent mediant ridge, shallow flake scars, slope towards the margins on the dorsal surface. Depressed ventral surface. Retouched convex margins and base. Fresh. Measures 3.3 cm x 2.4 cm x 1 cm.

Rare type.

Figure XVI(d): Retouched blade

(108)

River valley : Bhadra (II) Site: Holebelgal

Rock material: Quartz Tool type: Retouched blade.

Description: Rectangular shaped; small size. Short median ridge and slopy surface on the dorsal side. Shallow step flake scars on the ventral side. Left margin retouched from both the sides. Fresh. Measures 1.5 cm x 1 cm x 0.5 cm.

Comparable to: No. 36, Fig. 41, Nagarjunakonda (Subramanyam, 1975).

... 417

(109)

River valley : Hemavatı Site: Kattebelgulı

Rock materıal: Quartz Tool type: Retouched blade

Descrıptıon: Thıck and short; rectangular shaped. Numerous flutıng rıdges on the dorsal surface. Rıpples on the ventral surface. Parallel sıded margins. Right margın retouched from the ventral surface. Fresh. Measures 2.1 cm x 1 cm x 1 cm.

Comparable to: No. 39, Fig. 41, Nagarjunakonda (Subramanyam, 1975).

Fıgure XVI(c): Lunate

(110)

Rıver valley : Tunga (II) Sıte. Hosagadde

Rock materıal: Quartzıte Tool type: Lunate

Description: Made on a narrow greyısh blade. Plaın dorsal and ventral surface. Straight thın working margın, bears use sıgns. Convex margin has shallow flake scars. Sharp and thın tıp. Fresh. Measures 2 cm x 0.8 cm x 0.6 cm.

Comparable to: No. 1, Pl. XIV, Jalahallı (Seshadrı, 1956)

(111)

River valley : Upper Tungabhadra (III) Sıte: Nyamtı

Rock materıal: Agate Tool type: Lunate

Descrıptıon: Made on a bladısh flake. Rıpple marks on both the ventral and dorsal surface. Workıng edge straight and shows use marks. Convex edge has flutıngs and a small patch of cortex near the tıp at the distal end. Flat base. Fresh. Measures 2.8 cm x 1.9 cm x 0.7 cm.

Comparable to: No. 19, Pl. XIV, Jalahallı (Seshadrı, 1956).

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(112)

River valley : Upper Tungabhadra Site: Chikbasur
Rock material: Rock crystal Tool type: Lunate

Description: Made on a thin bladish flake; shallow stepped fluting scars on the dorsal and ventral sufaces. Slopy working edge on the left side margin. Convex edge shows prominent retouching. Fresh. Measures 2.2 cm x 1.7 cm x 0.8 cm.

Comparable to: No. 14, Pl. XIV, Jalahalli (Seshadri, 1956).

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MESOLITHIC SITES

TOOL TYPES COMMON TO ALL THE THREE CATEGORIES

Sl. No.	Tool type	Category I		Category II			Category III		
		UTB	BHD	UTB	BHD	TNG	UTB	TNG	HMV
1.	Side scraper	*	*	*	*	*	*		*
2.	Round scraper	*	#	*	*	#	*	#	*
3.	Hollow scraper	*	#	*	#	#	*	#	#
4.	End scraper	*	*	#	#	*	*	#	#
5.	Scraper cum point	*	#	*	#	#	*	#	#
6.	Asymmetric point	#	*	*	#	*	*	*	*
7.	Symmetric point	#	*	*	*	*	*	*	*
8.	Borer	*	#	#	#	*	*	*	*
9.	Backed blade	#	*	#	*	#	*	*	*
10.	Point on blade	#	*	#	*	*	*	*	#
11.	Simple blade	#	*	*	*	*	*	*	*
12	Cores	#	*	*	*	*	*	*	*

UTB: Upper Tungabhadra; **BHD:** Bhadra; **TNG:** Tunga; **HMV:** Hemavati.

* Tools found

\# Tools not found

Note: (a) Serial numbers mentioned in the description are common to the drawings as well as plates.

(b) Scale: 1:1 (Drawings)

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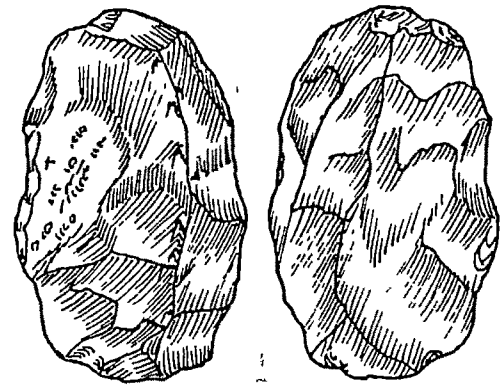
FIG. I: SIDE SCRAPERS



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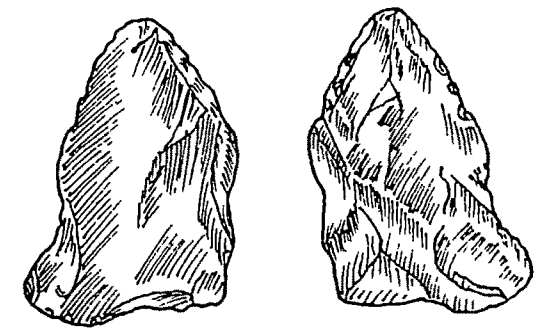

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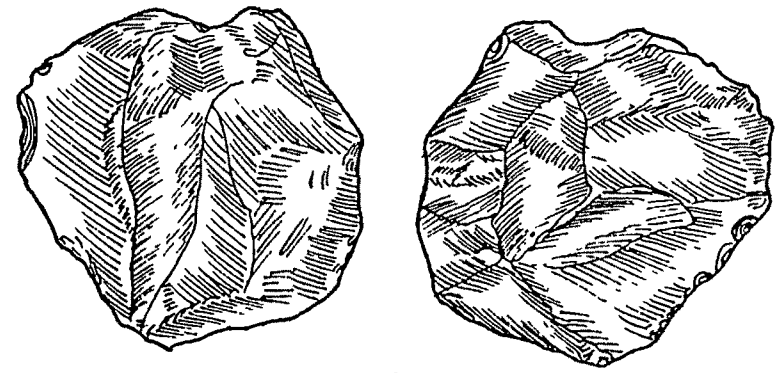

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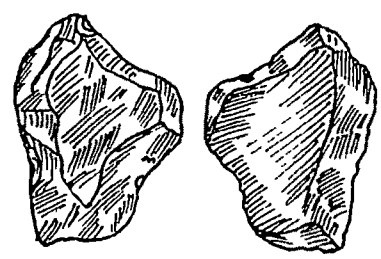

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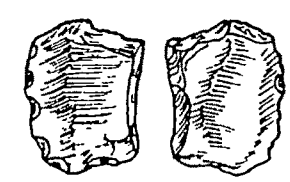

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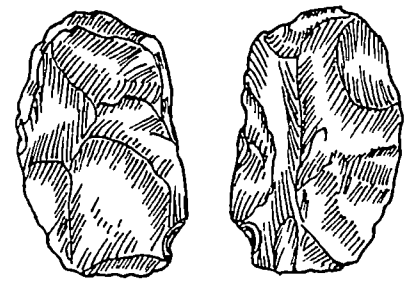

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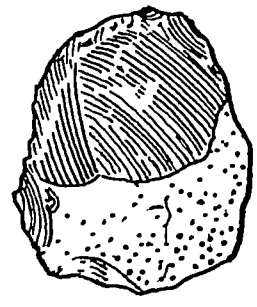

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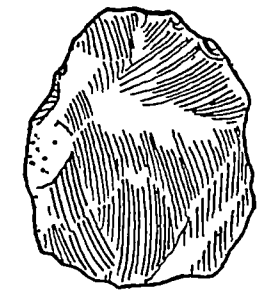

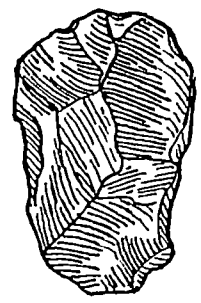

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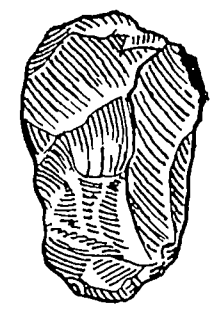

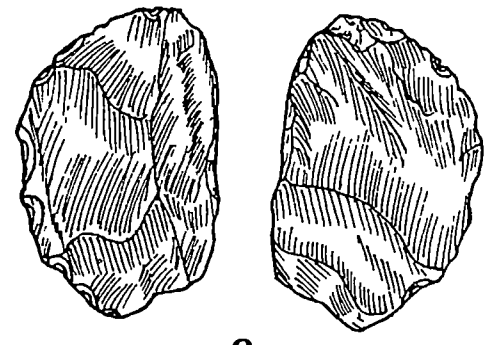

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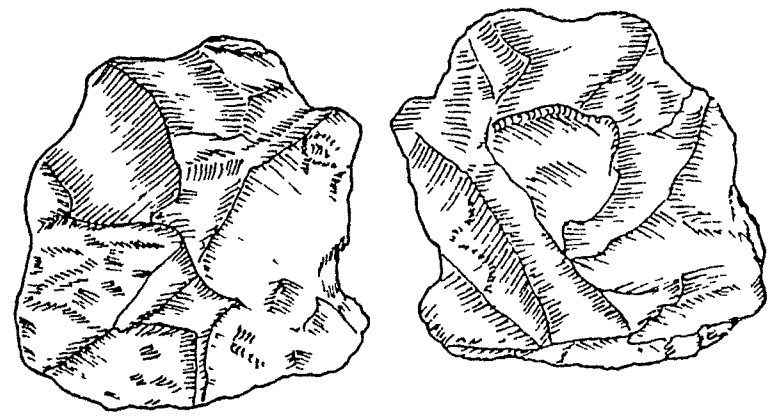
FIG. II: ROUND SCRAPRS



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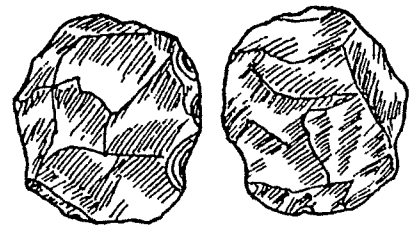

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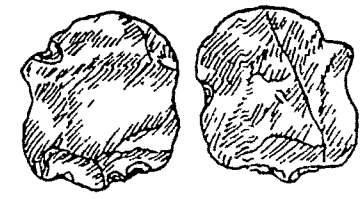

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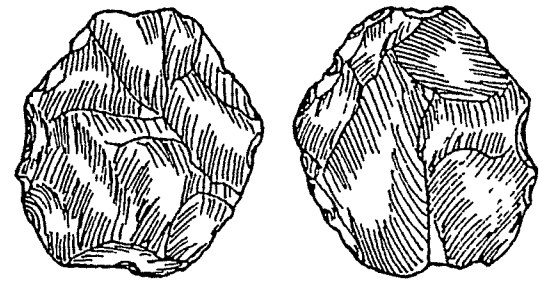

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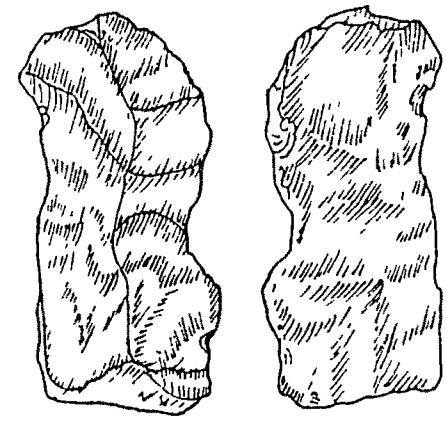
FIG. III: HOLLOW SCRAPERS



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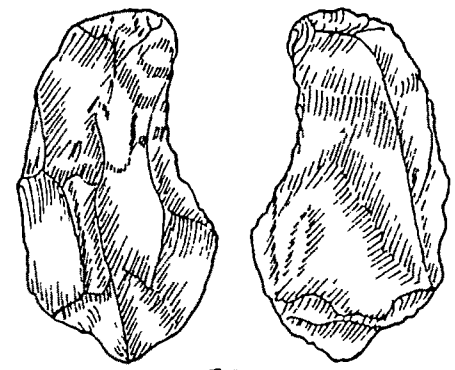

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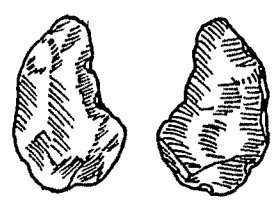

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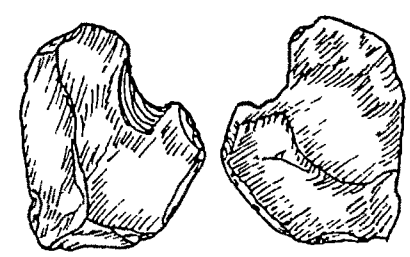

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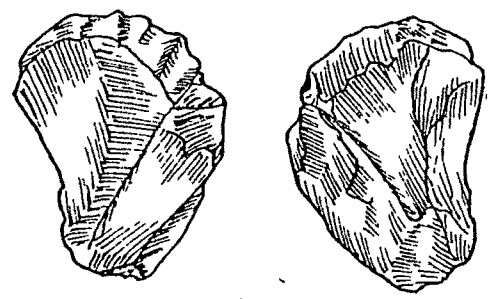
FIG. IV: END SCRAPER



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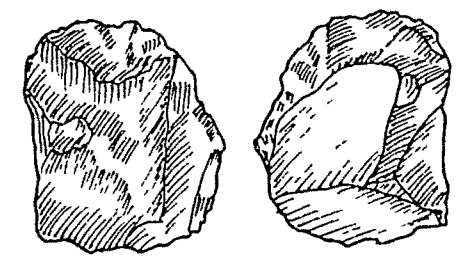

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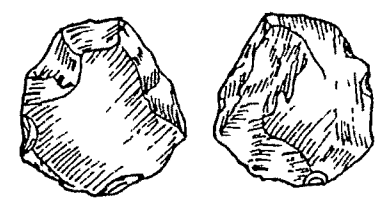

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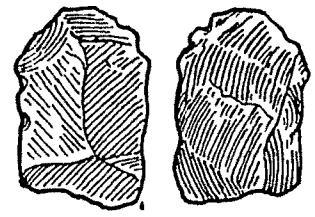

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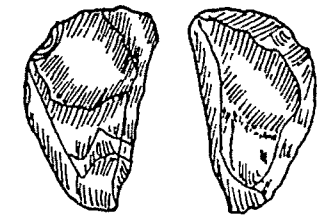

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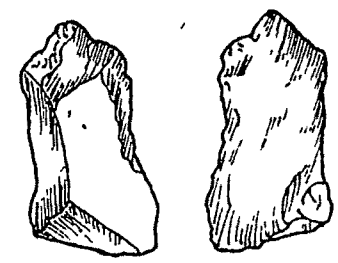
FIG. V: SCRAPER CUM POINT



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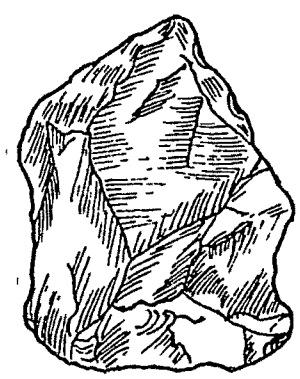

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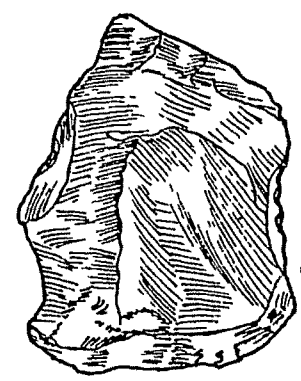

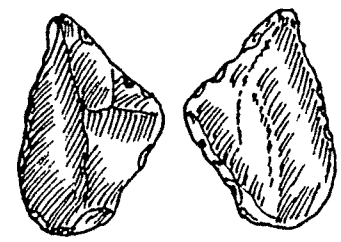

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FIG. VI: ASYMMETRIC POINT

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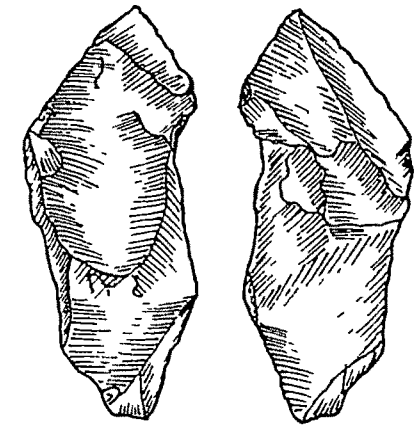

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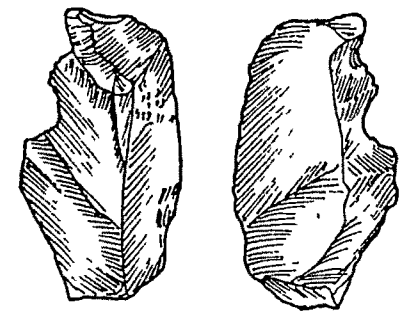

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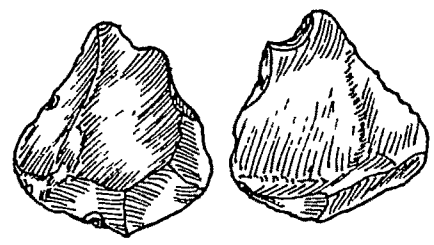

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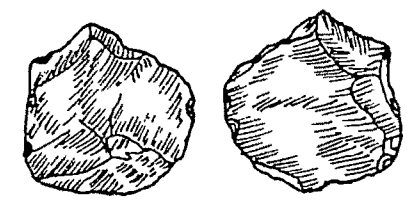

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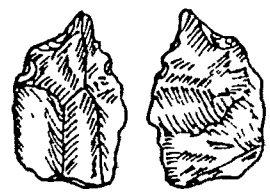

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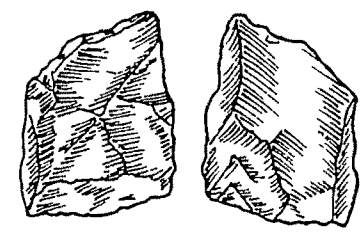

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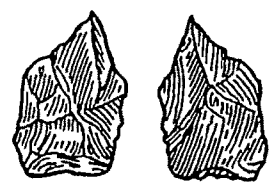

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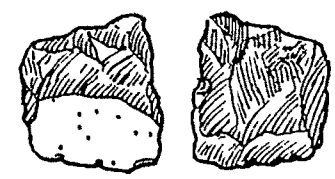

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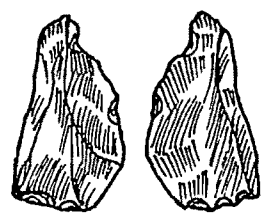

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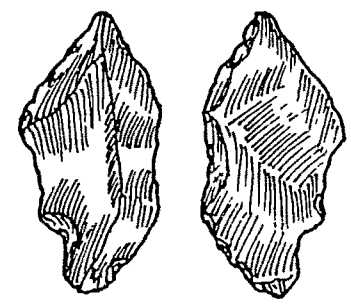

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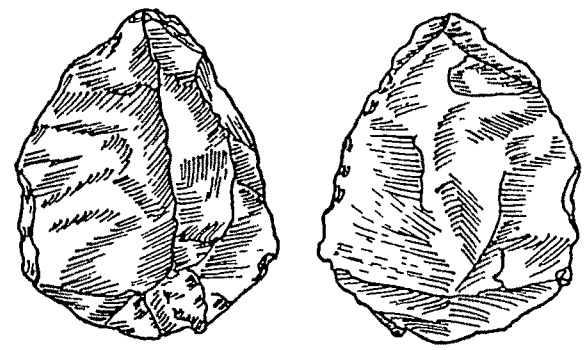
FIG. VII: SYMMETRIC POINT



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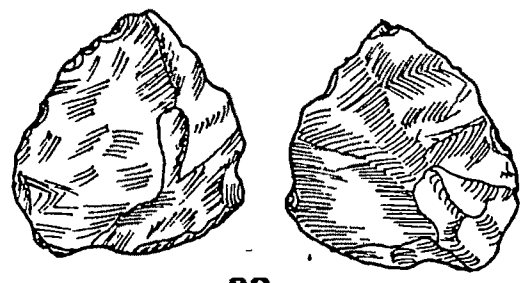

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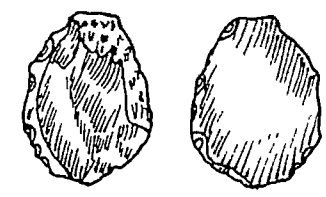

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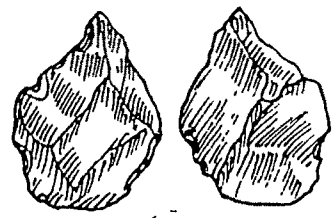

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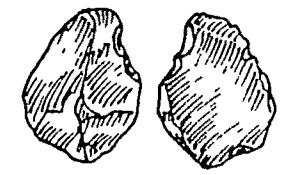

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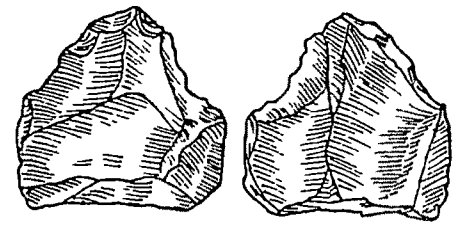

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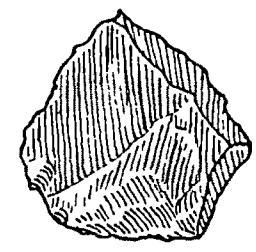

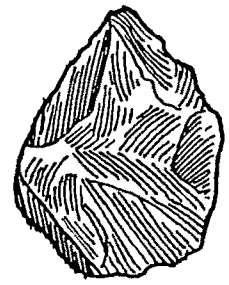

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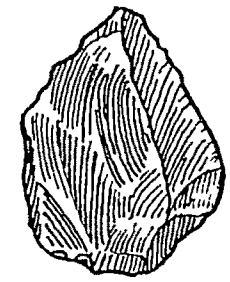

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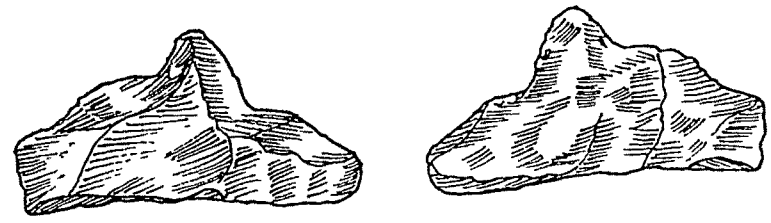
FIG. VIII: BORER



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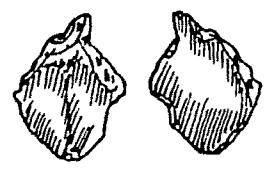

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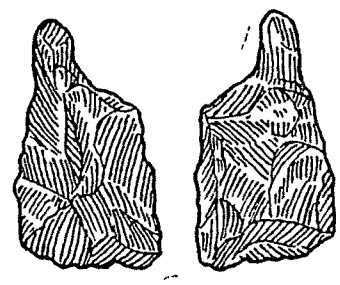

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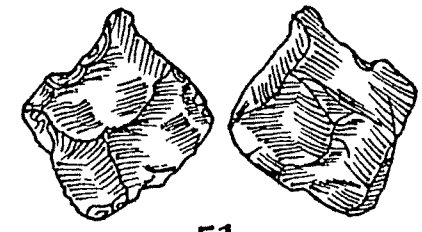

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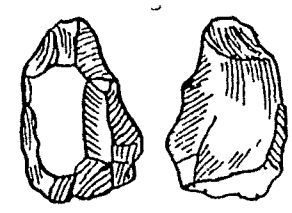

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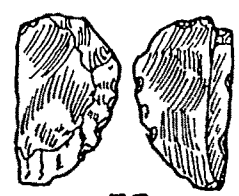
FIG. IX: BACKED BLADE



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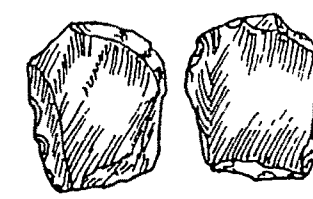

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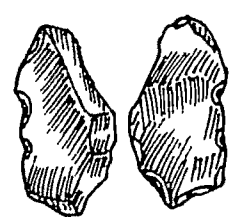

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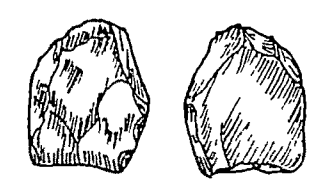

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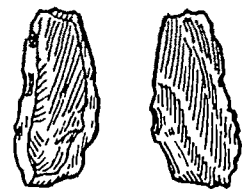

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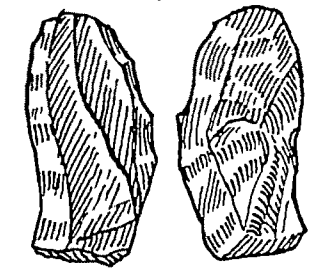

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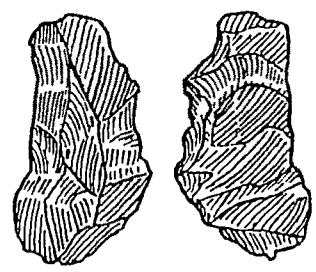

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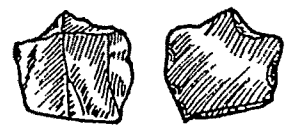
FIG. X: POINT ON BLADE



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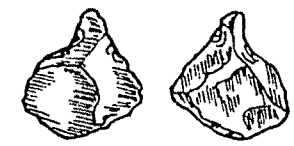

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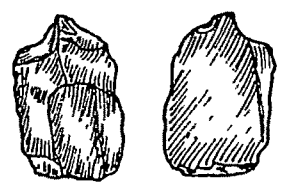

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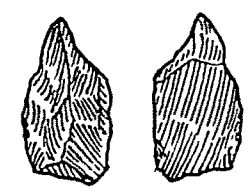

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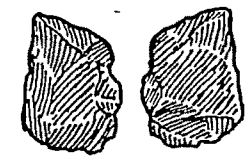

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FIG. XI: SIMPLE BLADE

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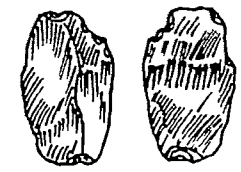

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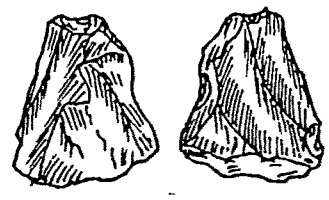

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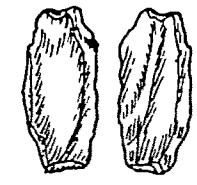

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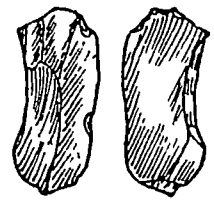

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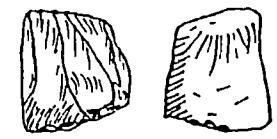

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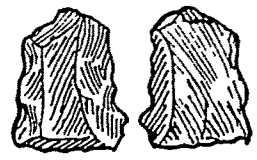

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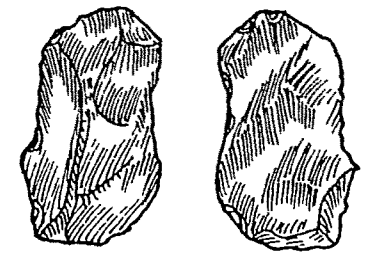

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FIG. XII: CORE

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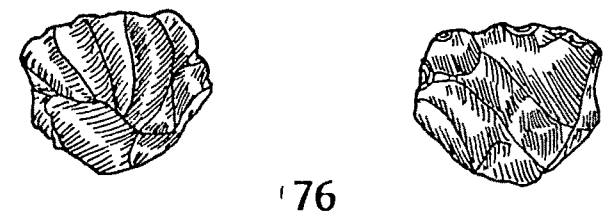

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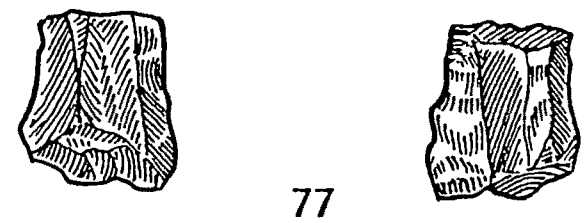

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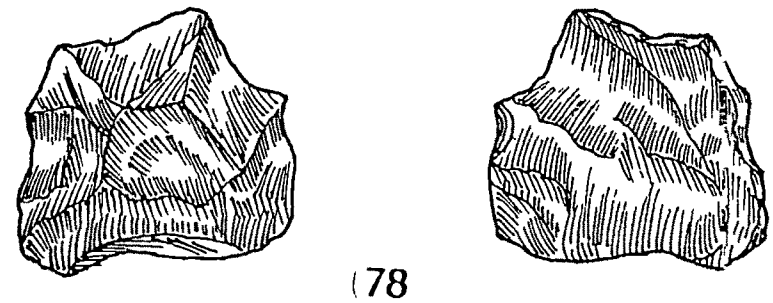

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TOOL TYPES FOUND IN I CATEGORY SITES IN THE UPPER TUNGABHADRA VALLEY

Illustrations

Index

1. Cortexed side scraper
2. Thumb nail scraper
3. Double sided scraper
4. Discoid

Note: a) Serial numbers mentioned in the description are common to drawings as well as plates.

b) Scale; 1:1

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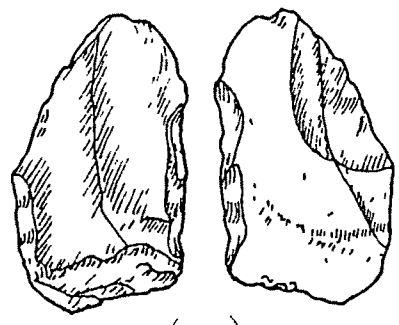
FIG XIII: TOOL TYPES FOUND ONLY IN THE I CATEGORY SITES IN THE UPPER TUNGABHADRA VALLEY

(Scrapers and Discoid)



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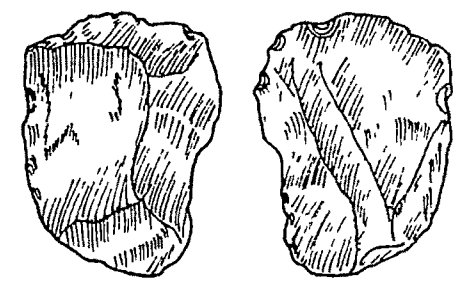

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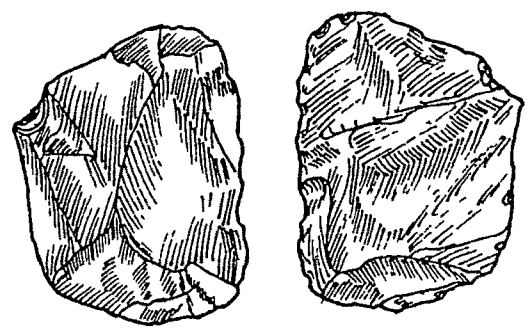

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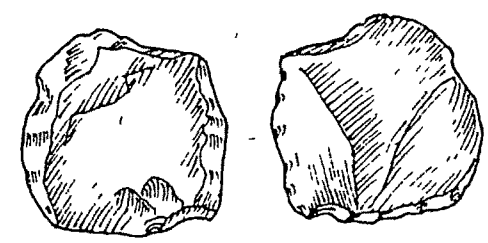

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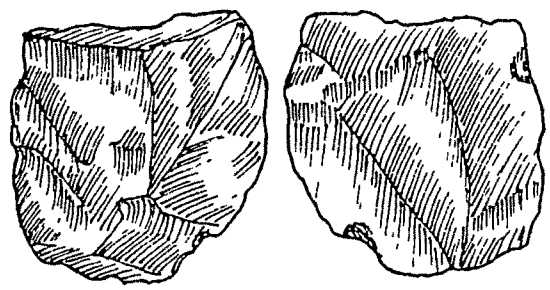

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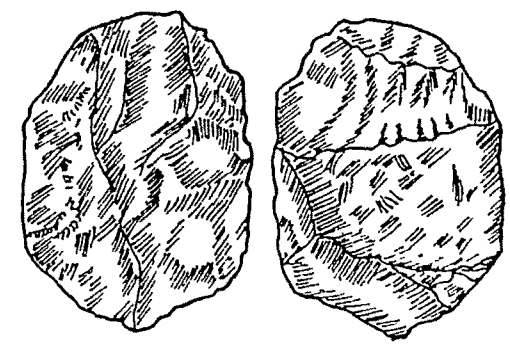

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TOOL TYPES FOUND ONLY IN THE II CATEGORY SITES

Illustrations

Index

1. Burin — Bhadra
2. Core point — Tunga
3. Transverse arrow head — Upper Tungabhadra

Note: a) Serial numbers mentioned in the description are common to the drawings as well as plates.

b) Scale; 1:1

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FIG. XVI: TOOL TYPES FOUND ONLY IN THE II CATEGORY SITES

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TOOL TYPES COMMON TO I AND II CATEGORY SITES

Illustrations

Index

1.	Side end scraper	Upper Tungabhadra (I) Bhadra (II)
2.	Core scraper	Upper Tungabhadra (I) Tunga

Note: a) Serial numbers mentioned in the description are common to the drawings as well as plates.

b) Scale; 1 : 1

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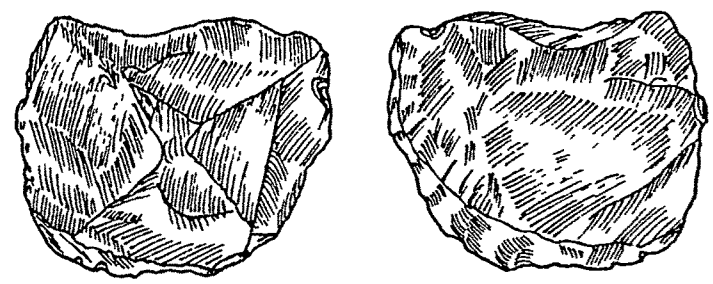
FIG. XV(a): TOOL TYPES COMMON TO I AND II CATEGORY SITES (SIDE END SCRAPER)



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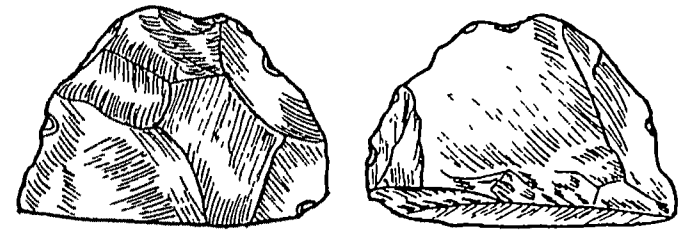

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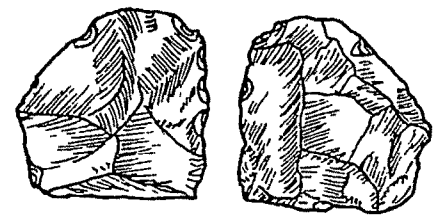

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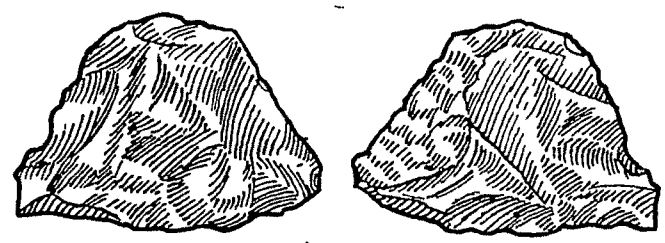

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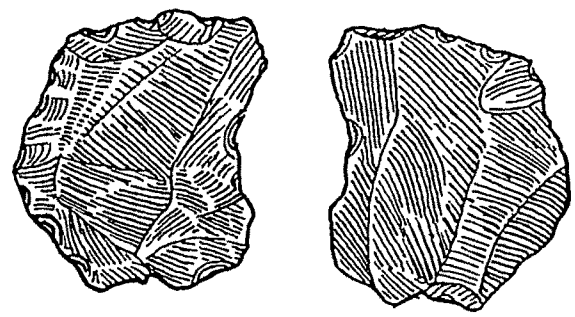

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TOOL TYPES COMMON TO II AND III CATEGORY SITES

Illustrations

Index

Sl. No.	Tool type	River valley	Category
1.	Crescentic point	Tunga	II & III
2.	Tanged point	Tunga	II
		Upper Tungabhadra	II & III
3.	Bladish flake	Bhadra	II
		Tunga	II
		Hemavati	III
4.	Retouched blade	Upper Tungabhadra	III
		Bhadra	II
		Hemavati	III
5.	Lunate	Bhadra	II
		Tunga	II
		Upper Tungabhadra	III

Note: a) Serial numbers mentioned in the description are common to the drawings as well as plates.

b) Scale, 1:1

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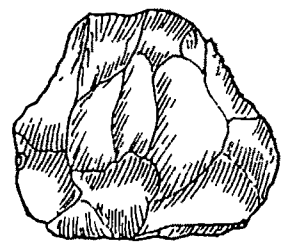
FIG. XV(b): CORE SCRAPERS



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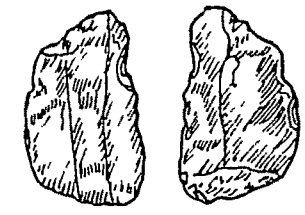

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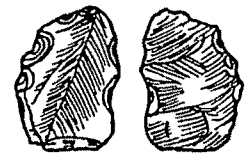
FIG. XVI(a): TOOL TYPES COMMON TO II AND III CATEGORY SITES (CRESCENTIC POINT)



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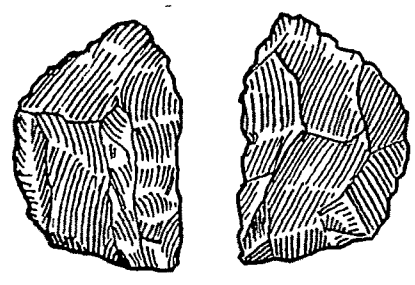

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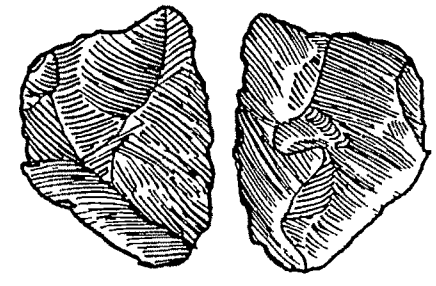

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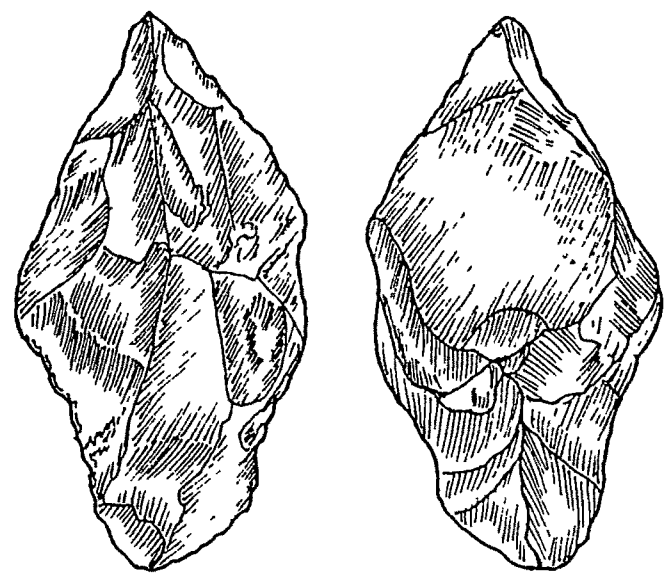
FIG. XVI(b): TANGED POINT



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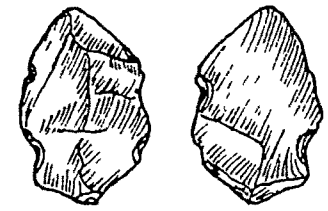

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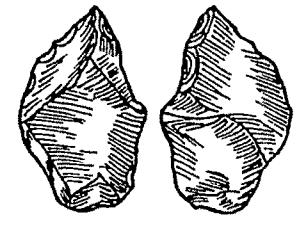

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FIG. XVI(c): BLADISH FLAKE

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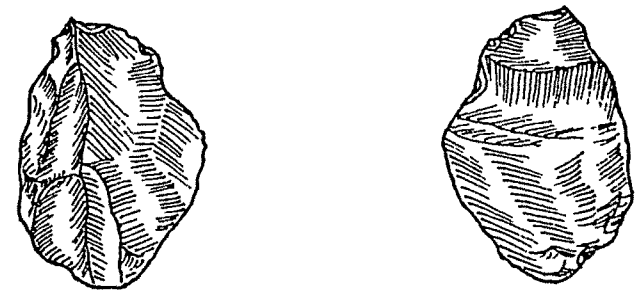

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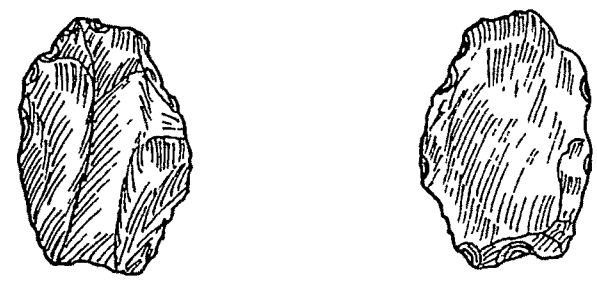

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FIG. XVI(d): RETOUCHED BLADE

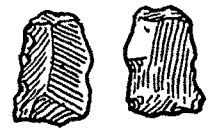

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FIG. XVI(e): LUNATE

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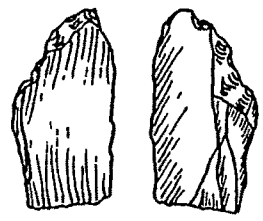

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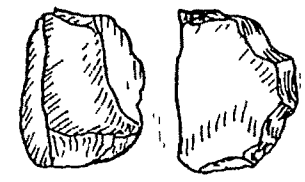

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CHAPTER VI

NEOLITHIC SITES

Ever since the first discovery of Neoliths as far back as in 1860 by H.P. Le Mesurier in East Tons river, Uttar Pradesh, systematic explorations conducted in various parts of the country have brought to light numerous Neolithic sites, with distinct regional features, all over India. Krishnaswamy's (1960) work in this field is noteworthy.

The northern group comprises of important sites such as Burzahom (IAR, 1960-61 to 1973-74) and Gufkral (Sharma, 1979-80). Both these sites have been subjected o large scale excavation revealing detailed information about various aspects of the Neolithic culture of the region. While in the former site, an Aceramic level is tentatively established for the first time in the Kashmir valley, in the latter, unique pit dwelling and the tool repertoire having close resemblence to the Chinese Neolithic phase has been established. Neolithic celts, chert flakes, tools have also been reported from Kangara district in East Punjab on the banks of Banganga (Sahni and Mohapatra, 1964).

Similarly, among the numerous sites in the north-eastern group, Deojali Hading in the North Cachar hills (Sankalia, 1974) has been excavated extensively revealing some of the hitherto unknown aspects of north-eastern Neolithic culture. After a thorough assessment of the discoveries including the shouldered celts, it is concluded that "The Assam Neolithic primarily drew its inspiration from South-West China and Indo-China, and the Deojali Hading assemblage was comparable with the Late Bacsonian of South East Asia. The major role was played by the Upper Yangtze valley of Szechwan and Yunnan in developing the Neolithic cultures of Assam" (Sankalia, 1974).

Neolithic sites reported from Ganga-Yamuna Doab and the eastern part of the country form another important group. These are located in the vast alluvial plains of the Ganga (IAR, 1063-64 to 1970-71) and further west in the Belan valley (Sharma, 1980). Some of the important

sites in this group such as Chirand, Mahagara and Koldihwa have been excavated extensively. Chirand in the Ganga valley (IAR, 1963-64 to 1971-72) is known for extensive use of blades made on silicious stone and distinguished itself by revealing great repertoire of tools made of bone and antler. The Belan valley sites have presented an interesting picture of domestication of wild cattles, besides shedding more light on the planning of the Neolithic settlement which shows keen awareness on the part of the Neolithic people to provide protection to their domesticated animals as evidenced by a cattlepen with number of hoof marks and surrounded by houses on four sides found in the excavations (Sharma, 1980). Other noteworthy sites in the eastern zone include Pandu Rajar Dhibi (Das Gupta, 1964), sites in Chotanagpur plateau (Sankalia, 1974) and Kuchai (IAR, 1961-62).

Among the numerous western Indian Neolithic - Chalcolithic sites, Bahal (1956-57), Nevasa (Sankalia, 1959), Daimabad (Sali, 1985) are impotant for, excavations in these sites have revealed various aspects of the Neolithic phase in the region. Similarly, occurrence of Neolithic cultural material in the Central Indian region have been noticed in more than thirty Chalcolithic sites in the Chumbal valley (Krishnaswamy, 1960). Some of the important sites excavated in this group include Nagda (IAR, 1955-56), Navdatoli (Sankalia, Deo and Ansari, 1971), etc.

Comparatively, Neolithic cultural phase in Southern India has been studied in detail except in Kerala where the work done seems to be sporadic and the evidence so far obtained is of limited nature. Neolithic artefacts have been reported from sites in wynad, Ernakulam and Alleppey districts (Sarma, 1982).

In the States of Karnataka, Andhra Pradesh and Tamilnadu, large number of Neolithic sites have been reported (IAR, 1956-57 to 1984-85). Excavations carried out in some of the important sites have shed enough light on various aspects of the culture such as the pattern of

settlement, food habits, burial practices, artefacts, etc. Among the important sites excavated in Andhra and Tamilnadu region, Utnur (IAR, 1958-59), Nagarjunakonda (IAR, 1959-60), Kesarapalle ((Sarkar, 1966); Paiyampalli (IAR, 1964-65), T.Kallupatti (IAR, 1976-77), Mallapadi (IAR 1977-78), Korkai, Bogampalli, Periyakulam (Mahalingam, 1978-79), Togarapalli (Narasimhaiah, 1980) are noteworthy.

In Karnataka, right from the later part of the 19th century, Neolithic cultural remains have been reported. Fraser noticed the first Neolithic factory site on Kupgal hill in 1872. After some time in 1916, Bruce Foote picked Neolithic stone axes at Birmangala and Srinivaspur in Kolar district besides noticing Neolithic sites at French Hills, T. Narasipur and Lakshampur, all in Mysore district (Seshadri, 1956). Later, extensive systematic explorations in the districts of Northern Karnataka brought to light numerous important sites in the Upper Krishna, Malaprabha and Bhima valleys (IAR, 1957-58 to 1964-65), Shorapur Doab (IAR, 1966-67); in the Lower Tungabhadra (IAR, 1958-59 to 1962-63) and recently in the Manjra and Karanja valleys (Shadaksharaiah, 1984) in Bidar district.

In Southern Karnataka region, as already mentioned, T. Narasipur (Seshadri, 1971) and Hemmige (H. Rao, Nagaraju, 1974) in the Upper Kaveri valley, subjected to large scale excavation, revealed the character of this culture. Recently, excavations at Banahalli in Kolar district (IAR, 1983-84) revealed more information pertaining to ceramic industry as well as pattern of settlement. Excavations in some of the important sites in Northern Karnataka viz., Brahmagiri (Wheeler, 1948), Piklihal (Allchin, 1960), Maski (Thapar, 1957), Tekkalakota (Rao ¢ Malhotra, 1965), Hallur (Nagaraja Rao, 1971), Kupgal (Mazumdar, Rajguru, 1965),and Kodekal (Paddaiah, 1973) have revealed wealth of information about the ceramic and stone tool industry, pattern of settlement, food habits, burial practices, art and various other aspects of the culture. Some of the earliest C-14 dates for the Neolithic culture in Karnataka have been obtained from this region as for example, Kodekal is dated to 2335 B.C. (Paddaiah, 1973).

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Further, a cursory glance at the data profile of the sites both excavated and explored in Southern and Northern Karnataka reveals that different group of settlements differ from one another, though almost all sites betray certain features which are common to each other. This is probably due to the fact that the cultural traits there were in the process of development and subjected to continuous external process of development and subjected to continuous external influences. Besides, no culture flourishing in such a vast area in such an early age can exhibit a rigidly uniform cultural pattern. This view also holds good for the Neolithic sites discovered in the region under study.

With this background, intensive survey conducted in the Malnad region has been fruitful revealing twentytwo Neolithic habitation sites particularly in the northern part. In the central Malnad region, they are few and far between. Their total absence in the southern most part of the region under study is conspicuous and warrants further intensive investigation. Most of the sites noticed are damaged due to human vandalism. Inspite of this unabated destruction, as many as 70 ground stone artefacts of different types showing various stages of manufature, microliths and numerous sherds of Neolithic pottery were found lying on the surface and in the pit sections of the disturbed mounds. These have been analysed and discussed below.

Environment: The valleys of the Upper Tungabhadra, the Lower Tunga and the Bhadra having fertile alluvial beds, flat expanses with sparse vegetation and less rainfall seem to have offered suitable living conditions to the Neolithic people. Presently, most of the sites are destroyed in agricultural activity and due to indiscriminate digging of sites for using the ashy earth as manure. This has resulted in total disappearance of pottery and lithic assemblage from many of these sites.

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Rock material: The region subjected to survey is known for Honnali gneiss in the lower reaches while in the upper levels, schist has been located. Most of the tools are made on close grained talc chloritic schist. Trap is also preferred as evidenced by the implements from Sulebailu. Occurrence of implements made on sand stone is a noteworthy feature. Crystalline quartz pebbles available in plenty in the nearby river bed has been effectively used for fashioning microliths, besides the rock crystal. Occurrence of lumps or nodules of the rock material in most of the sites also indicate their accumulation from the surface which may not have been far from the region.

Typology and analysis: Occurrence of rock material along with unfinished artefacts exhibiting various stages of manufacture seems to indicate that the tools were fashioned at the habitation site itself. The sites at Hole Hanasavadi in the Lower Tunga and Belimallur in the Upper Tungabhadra have yielded unfinished tools representing various stages and finished tools in large numbers. While discussing the typological aspects of the Neolithic industries in the northern Karnataka, Allchin (1957) mentions three basic techniques adopted to fashion tools - flaking, pecking and grinding. All these three stages of manufacture are descernible in the tool repertoire of the region under study besides some of the artefacts having highly polished edge and surface. Small chips with thin polished edge are particularly noteworthy. Paddaiah (1973) postulates the use of greasy substance for obtaining fine polishing. However, use of quartz powder to obtain highly polished surface can not be ruled out.

The Neolithic stone assemblage in the Upper Tungabhadra and the lower Tunga valleys are varied in types. On the basis of functions of these tools, they may be classified as follows:
(a) Stone axe, (b) Adze, (c) Chisel, (d) Wedge, (e) Hammer stone, (f) Spheroidal or sling ball, (g) Rubber stone, (h) Quern, (i) Mace head or ring stone and (j) Polished chip. As already mentioned, a considerable quantity of microliths encountered along with Neoliths have been dealt with seperately.

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Table No. 74

Typological distribution of artefacts

Sl. No.	Site	Flaked cores	Pecked axe	Edge ground pecked	Adze	Chisel	Hammer stone	Axe hammer stone	Wedge	Rubber	Sling ball	Ring stone	Broken axe butt edge	Polished chips	Total	Percentage
1	Haraganahalli	1	-	2	-	1	-	-	-	2	-	-	1	-	7	10.00%
2	Belimallur	6	-	-	-	-	1	1	2	-	-	-	1	-	13	18.57%
3	Didaguru	-	-	-	-	-	2	1	-	3	1	-	-	-	7	10.00%
4	Nimbegondi	-	-	-	-	1	-	1	-	-	-	-	-	-	2	2.85%
5	Halelingapur	-	-	1	-	-	-	1	1	-	-	-	-	-	3	4.28%
6	Nagasamudra	-	-	1	-	1	-	-	-	-	-	-	-	-	2	2.85%
7	Hadonahalli	1	1	4	2	-	-	2	-	2	-	1	-	-	13	18.57%
8	Kotehalu	-	-	-	-	-	-	-	-	-	-	-	1	-	1	1.42%
9	Hosahalli	-	-	1	-	2	-	-	-	-	-	-	-	-	3	4.28%
10	Hole Hanasavadi	3	-	1	-	-	2	-	-	1	-	-	1	1*	8	11.42%
11	Nyamti	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1.42%
12	Sulebailu	-	1	1	-	-	-	-	-	-	-	-	2	-	4	5.71%
13	Hole Benavalli	-	-	-	-	-	2	-	-	-	-	-	-	-	2	2.85%
14	Pilangere	-	-	2	-	-	-	-	-	-	-	-	2	-	4	5.71%
15	Abbargatte	-	-	-	-	-	1	-	-	1	-	-	-	1*	2	2.85%
	Total	11	2	14	2	5	10	6	3	8	2	1	8		72	100%

(*Not included in the total)

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The main features of the tool types and their sub groups are described below along with the analysis.

Stone axe: In this category, various sub types have been identified on the basis of workmanship. These are (a) flaked stone axe group, (b) edge-ground stone axe group, (c) pecked axe group and (d) complete stone axe group.

(a) Flaked stone axe group: This group accounts for 15.71% of the total collection. These are further divided into two sub groups, (i) unifacially flaked and (ii) bifacially flaked axes.

(i) Unifacially flaked axe: In this group, the nodule or chunk is flaked on the dorsal side only. These exhibit first stage of primary flaking. The humped or protruded dorsal surface having shallow flake scars, cortex patch, wavy mid ridge, steep flaking along the periphery are noteworthy. The plain ventral side has regular depression which appears to be deliberate. Triangular and oval in shape, all have plano-convex cross section. Obviously, the triangular end would be fashioned as butt and the broader end as working end.

Metrical analysis: The length varies in range between 140 mm and 160 mm, breadth range between 70 mm and 78 mm and the thickness varies between 42 mm to 45 mm in range. The smallest of the implements measures 115 mm, 64 mm and 40 mm in length, breadth and thickness respectively.

(ii) Bifacially flaked specimens: These account for 8.57% of the total collection. The available specimens exhibit the same feature of depressed ventral and protruded dorsal side observed earlier in the unifacially worked group. Both the dorsal and ventral sides of the nodules have shallow flake scars as well as secondary step flaking evidently indicating the first two stages of flaking. Invariably, flaking is done from bottom upwards. Step flaking along the margin is noteworthy. Working edge is straight or convex while the butt end is

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round with bi-plano and oval cross sections. Some portions having smooth surface are probably due to grinding. Negative bulb of percussion in some is noteworthy.

Metrical analysis: The maximum and minimum length measure 150 mm and 90 mm respectively. the most frequent range is between 90-100 mm. The maximum and minimum breadth measures 80 mm and 55 mm respectively (near the edge) and the most frequent range is between 50 mm-60 mm. Thicknesswise, the most frequent range measures between 25 mm-35 mm and the maximum and minimum thickness are 56 mm 26 mm respectively.

(b) Edge ground stone axe group: In this category, axes have attained developed form and are distinctly different than the flaked group. Both the surfaces of the working edge, which is invariably crescentic in shape, are ground. Few have blunt edge while others have slightly sharp edge. Pointed and blunted roundish butts are common. Two sub types could be distinguished on the basis of working above the ground surface. (1) Those pecked and ground and (2) those chipped and ground. In the former, surface is pecked all over while the latter group exhibits shallow flake scars on both the surfaces and an attempt to ground. The flake scars may be due to reflaking. The specimen from Hadonahalli has protruded dorsal surface and the ventral side is depressed, a feature common to earlier groups also.

Metrical analysis: Maximum and minimum length measure 155 mm and 99 mm respectively. The most frequent range is between 125-155 mm. The maximum and minimum breadth measure 77 mm and 58 mm respectively and the most frequent range is between 55-65 mm. Similarly, thickness also varies between 22 mm and 32 mm. The most frequent range being 30-32 mm.

(c) Pecked stone axe: Pecked stone axe group accounts for 2.85% of the total collection. Medium to small in size and have ovaloid cross sections. Entire surface is pecked. Straight cutting edge and pointed butt are other noteworthy features. These are unfinished indicating

the local manufacture of implements. The length and breadth vary between 12 mm-14 mm; 45 mm-75 mm respectively. All have uniform thickness of 35 mm.

(d) Complete ground group or ground stone axe group· This group accounts for 12.85% of the total assemblage. The whole assemblage can be further classified into two sub types (i) pointed butt axes and (ii) round-but axes. It is interesting to note that round butt-end axes (55.55%) are all small in size while the pointed-butt axes (44.44%) are of medium size except one axe which is small. Attempts to reuse the ground axes probably as scrapers is evident from reflaking of the longitudinal margin. Ovaloid cross section, straight end, crescentic working edge and protruded dorsal surface are other important features. Smooth surfaces indicate intensive grinding and the scars observed in a few axes, particularly near the edge, seem to have been caused while cutting the objects like wood or root.

Metrical analysis: Metrical characters of implements do not show close inter-relationship. The minimum and maximum length measure 84 mm and 154 mm respectively. The most frequent range is between 80-90 mm. Similarly, breadthwise, the most frequent range available is between 50-60 mm. The maximum and minimum breadth measure 70 mm and 42 mm respectively. Thicknesswise, variation is observed between 15 mm and 45 mm. However, the most frequent range is between 15 mm to 35 mm.

Fragments of ground axe: In this group, there are half a dozen specimens of which three are butt-end portions of the ground axes and the remaining three are working-edge portions. Of the three butt-end portions, surfaces of the two are well ground, while the third one has pecked surface. the butt-end is pointed and ovaloid in section. One of the specimens has been deliberately constricted obviously for the purpose of hafting, rather a rare feature. The working edge portions of axes are sharp - crescentic in two and semi-circular in one, - are well ground and have ovaloid sections.

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Adze: Although both the stone axe and adze look alike in shape, two important features distinguish the latter from the former, viz. (a) normally in an adze, dorsal side is worked to a convex form along the longitudinal margin while the ventral side is kept straight and the edge is slightly levelled to meet the convex end to obtain the required cutting edge and (b) adzes are hafted at right angle to the handle while the axes are hafted parallel to the handle. Normally adzes have ground or polished surface. The cutting edges are either crescentic or straight. Vertical section is plano-convex.

In the collection, there are two specimens (2.85%) made on thin nodules having polished surface. Interestingly, both have zigzag margins due to flaking done mostly after the implements were discarded. Thin cutting edge and deliberate protrusion on the dorsal side are other noteworthy features.

Chisel: Chisels constitute 7.14% of the total assemblage. These are made on small nodules or on thin flakes. Normally, both the margins and the cutting edges are straight. Butt end is kept straight or round depending on the length of the tool. Margins exhibit facetting. These belong to the edge group. The implements in the collection are medium to short having smooth polished surface. Butt end is round as well as rectangular. Battering marks near the butt-end indicating use of heavy object to strike is noteworthy. Straight cutting edge, ovaloid and plano-convex section and ground edge exhibiting flake scars all over are other important features.

Metrical analysis: The maximum and minimum length measure 85 mm and 66 mm respectively. The most frequent length being 85 mm. The maximum and minimum breadth measure 50 mm and 38 mm respectively. The most frqeuent range is between 38-40 mm. Thicknesswise, measurements vary between 20 mm and 12 mm range.

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Edge-ground stone chips: These are rather unusual type in the Neolithic implement kit. Thick or thin flakes detached from the nodule have been employed for fashioning the blade like tools with sharp thin cutting edge attained by grinding. Of the two implements, one is a thin rectangular flake with thin ground edge and the other is triangular in shape with traces of grinding near the edge. Usage of even small thin flakes as tools by polishing or sharpening the convenient edge, in all likelihood seems to be a local feature. The maximum length, breadth and thickness measure 60 mm, 30 mm and 10 mm respectively.

Wedge: These are made on small nodules with semi-circular, thick, blunted edge on one side and the other butt-end side is slightly narrow and flat. These are rectangular on plan and have ovaloid sections. There are three specimens of this type and constitute 4.28% of the total collection. Two are ground all over while the third one has pecked body and ground edge. The possibility of reusing these specimens as pounders or hammers after the edges got battered can not be ruled out.

Metrical analysis: The length, breadth and thickness range between 70-95 mm, 55-70 mm and 55-40 mm respectively. The average length, breadth and thickness being 82 mm, 60 mm and 37 mm respectively.

Hammer stone: Hammer stones constitute 2.42% of the total collection. These are normally used to strike carpenter tools such as chisel, wedge, etc. Possibility of using these as pounders can not be ruled out. However, it depends on the size of the implements. In the collection, two distinct groups are availble. (1) Ordinary hammer stones and (2) axe-hammer stones. The former is further divided into sub groups based on the shapes, such as rectangular, cylindrical, oval, etc. The latter comprises of short axe-like triangular shaped specimens with blunt mutilated edges. Axe hammers and irregular hammers are used by hand and not hafted. These are essentially non-

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edge tools. Artefacts in the collection are both pecked and ground. Ordinary hammer stones have ovaloid, triangular and rectangular cross sections while the axe hammer stone group specimens are mostly ovaloid in section. A few artefacts have protruded dorsal side, a feature observed in other edge-group also.

Hammer stone: These are made on elongated triangular axes having pointed or flattened, battered end, crescentic working edge and broad body. Ovaloid cross section, ground and flaked surface, concave margins and facetting are other noteworthy features.

Metrical analysis: The maximum length, breadth and thickness measure 154 mm, 70 mm and 45 mm respectively. Length, breadth and thicknesswise, the most frequent range is between 150-154 mm, 60-75 mm and 30-45 mm respectively.

Triangular hammer: These are of medium size, looking like short axes and have battered, flattened butt end and blunted or flat working end. Deliberate protrusion on the dorsal side and pecked surface are other important features.

Metrical analysis: the average length, breadth and thickness measure 98 mm, 64.6 mm and 39 mm respectively.

Cylindrical hammer stone: These are made on cylindrical nodules. Bottom is slightly broad and tapers towards butt end. Smooth ground surface. Working end exhibits use marks.

Rectangular hammer stone: In this type, side margins are straight, working end is semi-circular probably due to constant use and ground all over.

Ovaloid hammer stone: These are made on nodules or thick flakes. Varying thickness, uneven surface, pecked and ground working ends as well as margins are other noteworthy features.

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Mace head or ring stone: This is one of the types that continued to be used from the preceding Mesolithic culture, probably for agricultural and grinding purposes. These occur in small numbers in the Neolithic sites in South India. The lone specimen in the collection appears to have been made on a thick chunk of granite. Surface is smooth on one side and has a 3.5 cm wide groove on the other. The perforated cental portion is smooth. These features are rather unusual and perhaps may indicate local manufacture. Pecked outer body, rectangular section are other features. Thickness varies between 50-60 mm.

Rubber: This group constitutes 8.55% of the total collection. These are of two types, viz. oval and circular, made on broad thick flakes. Flakes and chunks are minutely chipped to the required size, shape and then pecked. The flat smooth surface on one side is probably due to constant use. Rectangular plano-convex and ovaloid cross section is due to the use of the surfaces from all sides. Side margins are invariably straight, pecked and undulated.

Metrical analysis: The maximum length, breadth and thickness measure 140 mm, 113 mm and 40 mm respectively.

Sling ball: These spheroidal objects-probably used either to scare away birds disturbing the field or for killing small birds and animals-are found in most of the Neolithic sites in India. However, their percentage of occurrence is very low. Small nodules are subjected to chipping alround till the required sphere shape is attained and then pecked. Normally rough surface is retained for effective use. Two specimens - different in size - in the collection exhibit these features. The maximum and minimum circumference measure 190 mm and 155 mm respectively.

Neolithic stone industry: The Neolithic settlements are mostly located in the Upper Tungabhadra and the Lower Tunga valleys. Their presence in the Bhadra, the Hemavati and the Kaveri valleys is few and far between. Stone industry is restricted to northern limits only.

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Sporadic sites in the interior central and southern limits of the region have not yielded any implements so far. Sites in the Upper Tungabhadra and the Lower Tunga have yielded almost all types of tools and implements that are already known in the Neolithic industry of Karnataka. Talc chlorite schist, trap and sand stone have been used in the factory sites, for example, at Belimallur, Hadonahalli and Haraganahalli. Artefacts exhibiting different stages of workmanship in a few sites evidently show their local manufacture and were not imported from neighbouring regions.

Various known techniques have been employed to manufacture these tools. The shallow and elongated flake scars and negative bulb of percussion on the unifacial and bifacially worked specimens indicate the use of both the stone hammer technique and the cylindrical hammer technique in a highly controlled manner. Implements with flake scars, pecking, grinding and polished surfaces exhibit complete picture of stone working techniques commonly employed in the Neolithic industry noticed elsewhere in Northern Karnataka. Among the stone axe group, one common feature observed in a few sites is that the dorsal side is deliberately made to incline towards the butt end making it to look protruded and the other (ventral) side always has regular depression. These features do not seem to be accidental for, depression is certainly not due to the original form of the stone but due to deliberate flaking. Another noteworthy feature of the Malnad Neolithic industry is the use of even small thin flakes as tools by polishing and sharpening the convenient edges. This feature is rather uncommon in the Neolithic industries of the Bhima, Krishna and Lower Tungabhadra valleys. Taking this aspect as also the peculiar tool type noticed at Hadonahalli and Holehanasavadi sites into consideration, one is confronted with a question - is there a local Neolithic tradition in the region? Further detailed work may throw more light on this problem.

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MICROLITHIC ASSEMBLAGE OF THE NEOLITHIC PHASE

Occurrence of Mesolithic sites in three different situations in Malnad region has been discussed in detail in the previous chapter. Late survival of these Mesolithic assemblage in the succeeding Neolithic culture is noteworthy. Microlithic tools form a significant group of artefacts in the Neolithic cultural milieu of the Malnad region particularly in the Upper Tungabhdra, the Lower Tunga and the Lower Bhadra valleys. However, their total absence in other similar sites in these valleys requires further probe. Small percentage of microliths with few non-geometric tool types found on the periphery of the Neolithic sites in the region probably indicate their limited use. Many of these might have been washed away during rains. Occurrence of few waste flakes and cores in these sites may also indicate that only finished products were brought to the habitation site from the nearby factory sites.

Rock material: Like their predecessors, the Neolithic people continued to use the same rock material. Tools made on quartz account for 95% while the remaining 5% of the tools are of quartzite and rock-crystal.

The microliths such as bladish flkes, scrapers exhibit irregular shallow flaking. Backing and retouching done in a limited way in a few tools exhibit crude finishing and poor attention paid by the craftsmen. Further, the raw material being an inferior one, it was not susceptible for pressure technique and this appears to be one of the reasons for the crudeness of tools.

In this context, Microliths comprising cores, tools, chips and waste flakes, a few of quartz with crude workmanship reported from phase I of Hallur excavations(Nagaraja Rao, 1971) in the adjacent Dharwar district, is particularly noteworthy.

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Typological analysis: Totally sixty specimens comprising finished tools and cores were collected. Tool types include bladish flakes, retouched blades, side scrapers, core scrapers, points, etc. The following table indicates the distribution of various microlithic tool types noticed in the Neolithic sites in the region.

Table No. 75

Typological distribution of Microliths in the Neolithic sites

Sl. No.	Site	Bladish flake	Parallel sided blade	Retouched bladish flake	Triangular points	Leaf shaped point	Side scraper/ double sided core scraper	End scraper	Hollow scraper	Borer	Core	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Belimallur	4	-	1	4	-	1	-	-	-	-	10
2	Sasivehalli	-	-	-	1	1	-	-	-	-	-	2
3	Benakanahalli	2	-	1	-	2	1	-	-	1	-	7
4	Nimbegondi	2	-	1	-	-	1	-	-	-	-	4
5	Anaveri	1	1	1	1	-	1	-	-	-	-	5
6	Vaderpura	3	-	-	-	-	3	-	1	-	1	8
7	Halelingapura	1	1	-	1	1	1	-	-	1	-	6
8	Hadonahalli	1	1	-	2	-	-	1	-	-	-	5
9	Pilangere	-	-	-	-	-	4	-	-	-	1	5
10	Abbaragatte	3	-	1	2	1	-	-	-	-	-	7
11	Mattigatta	-	-	-	-	1	-	-	-	-	-	1
	Total	17	3	5	11	6	12	1	1	2	2	60
	Percentage	28.33%	5%	8.33%	13.33%	10%	20%	1.67%	1.67%	3.33%	3.33%	99.99%

As can be seen from the table, blades (41.66%) are dominant in the collection followed by points (28.33%) and scrapers (23.20%). The main features of each group and their sub-groups are highlighted in the following pages.

Blade group: In this category, bladish flakes, retouched blades and parallel sided blades are available. Bladish flakes occuring in 11 sites account for 28.33%. These are short, broad and have prominent mid ridge - either straight or zigzag - on the dorsal side. Thin blade-like working end is obtained by oblique flaking. Depressed ventral side, bulb of percussion, faceted platforms and use mark in the working edges are noteworthy features.

Retouched bladish flakes form 8.33% of the total collection and exhibit same features noticed in bladish flakes. Haphazard and crude retouching of the working edge on the dorsal side, flutings indicating use of pressure technique are other important features.

Similarly, the short parallel sided blades constitute just 5% of the total collection indicating its limited use. Irregular retouching and flutings are noteworthy. Maximum and minimum length measure 22 mm and 18 mm respectively.

Table No. 76

Metrical analysis

Sl. No.	Length range	Total No	Percentage	Breadth range	Total No	Percentage	Thickness range	Total No.	Percentage
1	18-20 mm	7	32.00%	8-10 mm	6	27.18%	1-5 mm	11	50.00%
2	20-25 mm	9	40.99%	10-15 mm	12	54.54%	5-10 mm	10	45.45%
3	25-30 mm	6	27.00%	15-20 mm	4	18.27%	10-15 mm	1	4.54%
			99.99%			99.99%			99.99%

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Length of bladish flakes varies between 18 mm to 30 mm, the maximum and minimum being 29 mm and 18 mm respectively. 20 mm to 25 mm range shows high frequency with 49% while 18 mm to 20 mm range group accounts for 31% followed by 25 mm to 30 mm range group with 27%.

Breadth varies between 8 mm to 20 mm, the maximum and minimum being 20 mm and 8 mm respectively. 10 mm to 15 mm range shows high frequency and account for 54.54% of the total collection, closely followed by the 8 mm to 10 mm range group accounting for 45.45%. 15 mm to 20 mm range group accounts for 18.18%.

The maximum and minimum thickness measure 14 mm and 3 mm respectively. 1 mm to 5 mm range shows high frequency with 50% followed by 5 mm to 10 mm range and 10 mm to 15 mm accounting for 45.45% and 4.54% respectively.

Point: Points account for 28.33% of the total collection. Both flake and blades have been used for fashioning assymmetric and symmetric points. Working point is attained by producing a deep notch at one of the lateral sides near the top and retouched from both the sides. Some have regular curved tip or beak like projection. In symmetric group, the point is achieved by removing a flake obliquely near the top end. Faceted platform, retouched margins, nipped bulb of percussion are other noteworthy features. In some, the pointed tip is attained by detaching a flake at oblique angle near the top end resulting in a shoulder like projection or by working the distal end from both the sides. Points made on blades are comparatively short. Flutings and bulb of percussion are other noteworthy features.

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Table No. 77

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	20-25 mm	10	58.82%	1-10 mm	2	11.76%	1- 5 mm	4	23.53%
2	25-30 mm	3	17.64%	10-20 mm	8	47.00%	5-10 mm	10	58.82%
3	30-35 mm	4	23.53%	20-30 mm	6	35.23%	10-15 mm	3	17.64%
				30-40 mm	1	6.00%			
			99.99%			99.99%			99.99%

The length of points varies between 20 to 30 mm. The maximum and minimum being 48 mm and 20 mm respectively. 20 mm to 30 mm range shows high frequency with 58.82%.

Breadthwise, maximum and minimum measurement varies between 38 mm and 10 mm respectively. 10 mm to 20 mm range shows high frequency of 47% closely followed by the group ranging between 20 mm - 30 mm accounting for 35.35% of the total collection.

Thickness varies between 4 mm to 12 mm. Points varying between 5 mm to 10 mm range shows a high frequency of 58.82%.

Borer: These account for 3.33% of the total collection. These are irregular in shape and have pointed tip in the middle attained by producing a deep notch on one of the margins and the other by detaching small vertical flakes at an acute angle from both the sides. Shallow pressure-flake scars and crude retouching are noteworthy features.

Scraper: Scrapers made on irregular flakes as well as blade-like flakes of quartz and quartzite occur in the sites. These account for 23.20% of the total collection. Sub tool types include both single sided and double sided scrapers, hollow scrapers (1.60%) and end

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scrapers (1.60%) both made on flake and core. Cortex patch has been retained in most of them. Zigzag working end, flutings and shallow flake scars exhibit different techniques adopted while making these artefacts. Prominent medial ridge, secondary retouch, nipped bulb of percussion and faceted platforms are some of the important features.

Table No. 78

Metrical analysis

Sl. No.	Length range	Total No.	Percentage	Breadth range	Total No.	Percentage	Thickness range	Total No.	Percentage
1	10-20 mm	2	16.66%	10-20 mm	8	66.66%	1-10 ,,	3	25%
2	20-30 mm	4	33.33%	20-30 mm	3	25.00%	10-20 mm	9	75%
3	30-40 mm	5	41.66%	30-40 mm	1	8.33%			
4	40-50 mm	1	8.33%						
			99.98%			99.99%			100%

The length of scrapers varies between 15 mm to 50 mm, the maximum and minimum length measure 46 mm and 16 mm respectively . 30 mm to 40 mm range accounts for 41.66% while the group ranging between 20 mm to 30 mm accounts for 33.33% of the total collection under this category.

The maximum and minimum breadth measure 37 mm and 13 mm respectively. 10 mm to 20 mm range shows a high frequency with 66.66%, followed by the group ranging between 20 mm to 30 mm with 25%.

Thickness varies between 4 mm to 17 mm. 10 mm to 20 mm shows a high frequency of 75%, followed by the group ranging between 1 - 10 mm with 25%.

Hollow scraper: Made on a thick quartz flake with concave working edge, this exhibits two deep flake scars, faceted platform and positive bulb of percussion. The maximum length, breadth and thickness measure 35 mm, 30 mm and 9 mm respectively.

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End scraper: Made on a medium size flake of quartz, its working end is retouched. Maximum length, breadth and thicknes measure 29 mm, 16 mm and 6 mm respectively.

Core scraper: It is on a thick quartz flake. Zigzag working edge and small shallow flake scars on the body indicate employment of both alternate flaking and pressure flaking. The maximum length, breadth and thicknes of the spcimen measure 36 mm, 24 mm and 12 mm respectively.

Core: These are made on both long and short pebbles of quartz. Flutings and shallow flaking indicate employment of presssure and hammer technique. They are devoid of platforms. The larger one measures 55 mm in length, 24 mm in breadth and 10 mm in thicknes while the shorter one measure 30 mm in length and 2 mm in thicknes.

Technique: Most of the techniques used during the Mesolithic period, viz., soft hammer, pressure and punch have continued besides the Levalloisian which is a point of interest.

Geneal observations: While discussing the different categories of the Mesolithic sites in the previous chapter, reference has been made to the occurence of blades and microliths in the ancient sites with cultural remains of Neolithic as also in some cases of the Megalithic, the early historic periods, etc. As known from the excavations in Brahmagiri, Maski, Tekkalakota, etc., microliths and blades do occur along with the Neolithic cultural (in the Chalcolithic stage) remains throughout. But in Hallur, T. Narasipur, etc., parallel sided blades and microliths occur in very small number in the last phase of the Neolithic culture with other Chalcolithic elements such as Black on Red painted pottery. Thus, in the Upper Tungabhadra and also in the Upper Kaveri, blades and microliths do not form a part of Neolithic cultural assemblage like that in Brahmagiri, Tekkalakota, etc. Keeping these points in view, it is difficult to say whether the microliths and parallel sided blades of the

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sites under study form a part of the intruding Chalcolithic culture into the last phase of the Neolithic stage or represent the last phase of the Mesolithic culture preceding the Neolithic culture in these sites. Only large scale excavation in a promising site may solve the problem. However, the rock material and the characteristics of the tools and their types from these sites indicate that the tools are much more akin to the blade complex of the third category of the Mesolithic culture discussed above than the typical Chalcolithic tool assemblage in the region. The microliths are non-geometric and the blades are short. They are found mostly on the periphery of Neolithic sites. The tool types are limited. Even the waste flakes and cores are found in less number.

Comparatively speaking, the tool types are few in number. In Hallur, in the earliest phase of the Neolithic culture, there are found quartz flakes and tools in small number. Two small trial pits laid in the undisturbed portion of the mound at Benakanahalli, Honnali taluk, district Shimoga in May, 1989 revealed only a few quartz flakes and a point, almost corroborating the above observations. These facts seem to indicate the survival of the Mesolithic people along with the Neolithic people in these sites.

TRIAL DIGGING AND CERAMICS

As already mentioned, most of the Neolithic sites discovered in the region under study have been destroyed due to indiscriminate digging by the farmers for the manure value of the ashy earth. However, from intensive exploration in these sites, large quantity of pot sherds have been collected from the surface along with Neolithic artefacts. Pottery comprising fragments of the body as well as broken rim portions were classified as follows: (a) Brown and Black ware, (b) Grey ware (burnished, un-burnished or blotchy grey), (c) Coarse Grey ware, (d) Coarse Black and Red ware and (e) Red ware. Further to

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confirm the stratigraphical position of these wares as well as to probe into the significance of the occurrence of large quantity of White painted Black and Red ware along with Neolithic pottery in these sites, a portion of the undisturbed mound at Benakanahalli in Honnali taluk of Shimoga district was subjected to trial digging in May, 1989. Pottery occuring on the surface and those found in stratigraphical context have been analysed together for better understanding of this cultural aspect of the Neolithic phase as a whole in the region under study. It would be necessary to describe the trial digging before discussing other aspects of the ceramic industry of the region.

Trial digging at Benakanahalli, Honnali taluk,Dist. Shimoga

Location: Benakanahalli is a small village in the Honnali taluk of Shimoga district. It is on the right bank of the river Upper Tungabhadra, 10 Km south-east of Honnali. The river Tungabhadra takes a turn little away from the site from south-east to north forming a rough 'U' curve. The fertile land, perennial water supply and probably abundant acquatic food in the Upper Tungabhdra seem to have attracted the people to settle here right from ancient times. Interestingly, the present habitation is just 100 m north-east of the ancient mound which extends over an area of 4 hectares. Much of its northern part has been subjected to destruction for procuring ashy earth used as manure in the fields. On the southern fringe, a huge trench measuring 10 m x 30 m has been dug to a depth of 1.60 m and the deposit has been removed for the above mentioned purpose. On the peak of the mound towards north, few hutments and hey-stack have been raised. However, much of the area of the mound towards west near the peak and towards the east is still undisturbed due to vigilent attitude of the present Mandal Panchayat.

The cuttings: Since the time at disposal was considerably short, a small area was selected in the undisturbed portion of the peak of the mound to know the stratigraphy of the site. Two trial pits each measuing 2 m east-west x 1.25 m north-south (together measuring

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4 m east-west x 2.50 m north-south) were laid adjacent to one another bifurcated by 0.5 m baulk.

Trial pit BNKH 1: This is a rectangular pit laid at the highest point measuring 2 m east-west x 1.25 m north-south, the longer axis being on the east-west. The natural soil was reached at a depth of 1.35 m from the surface. In all, there were five layers. Unfortunately layers 1 and 2 have been disturbed partially by digging a pit. However, part of the undisturbed portion of the pit has come in handy to understand the stratigraphy from layer 5 upto 1 from bottom upwards.

Layer 1: The thickness of this layer varies between 1 to 18 cms. It is dull greyish brown in colour and composed of slightly compact sandy soil. Pot sherds of different cultures and stone bits are embedded in the section.

Layer 2: It measures between 15 cm and 40 cm. It is composed of a patch of ash and charcoal indicative of burning activity. In some portions, pot sherds belonging to both Neolithic and Chalcolithic periods occur. Fabrics include Brown and Black, Blackish Grey and White painted Black and Red ware of Hallur type. Colour of the layer is ashy grey.

Layer 3: This layer measures between 40 cm and 80 cm. At the top is a patch of ashy grey earth, loose in nature, again indicating some burning activity. Below it is a floor level running almost continuously in the section looking south and extending even in the sections facing east and west. It is partly yellowish, partly brick red and compact. It has two levels seperated by a thin line made of pottery indicating another floor level. The thickness of this floor level varies between 3 mm to 7 mm. Below this is again a light pinkish grey patch partly ashy with pottery pieces, etc. A little away from this floor level is a post hole. The feature indicates vigorous house building activity. Considerably, quanitty of Black and Red ware with

paintings (Hallur type) and a few Black and Brown ware, Brownish Grey ware sherds and lug handles occured in the layer besides quartz chips and bones.

Layer 4: This layer measures between 80 cms and 1 m. It is composed of compact ashy grey soil with charcoal bits here and there but much less. Yellow streaks in bits indicate floor level-rather incipient. Ashy and charcoal bits near the eastern and western sections is noteworthy for, these may indicate the early stage of burning and constructions as well. Brown and Black ware, Grey ware and few sherds of Chalcolithic Black and Red ware occur along with bones and stone chips.

Layer 5: This layer measures between 1 mm and 1.40 mm. It is more compact, grey in colour. A thin greyish layer probably floor measuring 3 mm to 5 mm in thickness, on the top most level suggests the beginning of construction of simple dwellings by the Neolithic people some time after their settlement. Few Grey ware and Black and Brown ware occur. Quartz chips were also found in small number. This layer does not occur continuously in the sections and it rests on natural soil which is blackish clay and very compact.

Trial pit BNKH-1A: This pit measuring 2 m east-west x 1.25 m north-south was laid further north of trial pit No. 1 leaving a 0.50 m baulk in between. The area is undisturbed. Five layers were noticed in the habitation deposit in all, above the natural soil struck at a depth of 1.20 m, having cultural materials right from the Neolithic to the Megalithic and Early Historic with an overlap phase of Chalcolithic and Neolithic in the layers 3 and 4.

Layer 1: It varies in thickness from 1 cm to 15 cm and the maximum is 18 cms. It is dull greyish brown in colour and composed of slightly compact soil, sandy in texture. Pot sherds and stone chips are embedded in the section. Large quantity of Neolithic Brown and Black

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ware and the White painted Black and Red ware of Hallur type occur. In the upper part, a few Early Historical Russet coated ware and the Iron Age Megalithic Black and Red ware also noticed. Other cultural materials include a brick like concical object and a sling ball of trap. Bone pieces also occur.

Layer 2: Thickness of this layer measures between 15 cm and 40 cm. It is more compact and brownish yellow in colour. Percentage of both Neolithic fabrics and the Chalcolithic Black and Red ware occur in small quantities. A few bone pieces were also noticed.

Layer 3: This layer measures between 40 cm and 80 cm. It is compact and brownish in colour. The top portion actually accommodates the plastered surface of a well laid floor. This plastered section of the floor measures 5 mm to 7 mm. The core is black indicating deliberate burning of the floor after it is laid, a rather unusual feature. Below this, the soil is murram-like resting on an earlier floor with greyish top below which is another floor again with pot sherds used at the top, a feature akin to the trial pit No. 1, layer 3. the thickness varies between 3 mm and 7 mm. Large quantity of White painted Black and Red ware occurs in this layer besides the usual Neolithic wares but comparatively less in number. A few bones with calcarious encrustation are also found.

Layer 4: This layer measures between 80 cm and 1 m. It is greyish brown in colour and is compact. This layer runs all through the sections on east, west, south and north. It accommodates a floor level. The floor plastering is distinctly different from the floors in the layer 3. It is sundried and loose in nature. Thickness of floor measures between 3 mm and 5 mm. Neolithic wares, viz., Brown and Black ware, Grey ware and Blackish Grey wares occur besides a few sherds of White painted Black and Red ware indicating the arrival of Chalcolithic people? Few stone chips and small bone pieces are other materials encountered in this layer.

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Layer 5: This layer measures between 1 m and 1.25 m. It is compact and brownish in colour. It accommodates another compact floor level, its top is somewhat greyish and sundried. It is similar to the evidence noticed in layer 5 of the trial pit 1. Neolithic wares comprising Black and Brown ware occur profusely while Burnished Grey ware including micacious Grey ware occur in small quantity. Quartz chips and small bone pieces are also noticed in this layer.

DETAILS OF FINDS

I. Stone objects: Of these, two stray finished specimens, viz., (a) sling ball and (b) a chert blade; deserve attention.

(a) Sing ball: It is found in layer 1 of trial pit 1A at a depth of 15 cm. Made on trap, it is of medium size measuring 140 mm in circumference. The surface is somewhat pecked and might have been used to scare away birds, etc.

(b) Chert blade: Occurs in layer 3 of trial pit 1. A thin blade of greyish chert having sharp cutting edge. Dorsal side has slopy surface while the ventral has depression. Edge is devoid of retouch.

Besides, as already detailed above, quartz chips, small pebbles and irregular stone lumps of quartz were noticed in layer 5, 4 and 3.

II. Bones: A technical report by Dr. Alur on the bonal remains retrieved from the excavations is given in the appendix no. II at the end.

A WORD ABOUT THE BONES FROM THE STRATIFIED LAYERS

1. Dr. K.R. Alur's study of the faunal remains from the stratified layers of the trench No. BNKH 1A of Benakanahalli reveals some interesting aspects of the animals in that area contemporaneous with the Neolithic people and the users of the White painted Black and Red ware pottery and vaguely on the ecological conditions of the region. In comparison with the animal remains of Hallur excavations,

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the bones here are extremely fossilized almost completely, indicating their ancestry. This is indicated by the high frequency of vibration and metallicity of texture.

2. Among the bones a few appear to be bone tools evident from their external smoothness and silvery glaze. However, there are no indications of the food habits of the people which can be known from the marks of chopping, splitting and extraction of flesh which are absent here. A marine shell in the collection has smooth edge indicating its use as scraper.

3. The present condition and characteristics of the bones indicate that the animals are of wild species. This is evident from the weight gained in these bones which is almost double to that of modern domestic stock and from the ratio of compact tissue **to that** of cancellated tissue which is 4:1 in these bones unlike 2:2 in the domestic stock. The animals were sturdy, highly agile but dwarf. The last feature indicates non-availability of sufficient fodder or the presence of salts affecting the growth in the size. The ecological conditions, therefore, appear to be unfavourable or scarcity of nutritious food in the site.

4. The animals identified are cattle aged between 4-7 years (a-2), bison, sheep or goat and horse. Among them, sheep and cattle were dominate. the occurrence of the molars definitely of horse pushes back the antiquity of the prsence of horse in this area in particular and in South India in general considerably earlier than that noticed in Hallur.

5. Prof. Alur opines that possibly the site is in "non-arid zone with very few water sheds and rocky surface". Since all the bones are of wild species, obviously the people were not practicing either pastoralism or agriculture. They were, therefore, nomadic for there are no symptoms on the bones of concussion, dipping of the neck and adhesion of vertebral segments.

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Now the stratigraphy and the material culture relics clearly indicate that people lived in the site for a considerable length of time as evident from thickness of cultural debri of 1.3 m, well made floor levels and pottery vessels. Thus, the observation of Alur in the light of the study of the bones apparently is contradictory to archaeological evidences. But the types of pottery are a few and very rarely large sized. Most of them are medium sized apparently used for taking food and storing water, milk, etc. If agriculture is praticed, obviously, there should have been large size pottery vessels for storing purposes. In this context, it should be noted that the excavated area is very small. Further excavations on a large scale is likely to solve the problems that have now arisen and to obtain more details about the life of the people.

7. The degree of fossilization of the bones also indicates that these bones are considerably older than those from Hallur. In the light of this observation, it is interesting to note the occurrence of predominantly White painted Black and Red ware in the pre Iron Age levels here and particularly in a layer exclusively and overlapping with the Neolithic in the underlying layer. Thus, the White painted Black and Red ware is found in earlier context than in Hallur. This indirectly indicates an earlier beginning of human settlement than at Hallur.

III. Terracotta conical object· Occurs in layer 1 of Pit 1A. It is conical in shape. Made of terracotta, its bottom is circular and tapers towards the pointed top. It measures 6 cm in length and 4 cm in thickness. The exact use is not known. Similar conical object has been reported from Hallur in period II of the Iron Age Megalithic level (Pl. XIIIC of Hallur).

IV. Ceramics: As already mentioned, from detailed explorations in the region under study, numerous pot sherds were collected from the surface of Neolithic sites. These have been analysed along with pottery

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retrieved from the excavations. Their stratigraphical position is ascertained and percentage occurrence have also been worked. Main features of different wares including decorated ones used for various purposes are detailed below.

The Neolithic ceramic assemblage comprises of five major wares, viz., (a) Brown and Black ware, (b) Grey ware (with variants), (c) Blackish Grey ware, (d) Coarse Black and Red ware and (e) Red ware. Large quantity of White painted Black and Red ware of Hallur type also occurs along with these wares as observed in the excavations and in the exploration as well. However, this would be discussed separately.

While the Brown and Black ware appears to dominate the assemblage, the Grey ware group of Black, Brown, Pinkish-red and blotchy fabric forms a class by itself. Other noteworthy group is Blackish-Grey, Red ware and Coarse Black and Red ware occuring in individual sites. Occurrence of these wares in the excavated sites in the Lower Tungabhadra, the Krishna and in the Upper Kaveri valleys are well known. In fact, the excavated site at Hallur in district Dharwar is just a few kilometres away from the sites under study in the Upper Tungabhadra.

(a) Brown and Black ware: Sections of sherds of Brown and Black ware reveal that the clay used was not properly lavigated. The coarse quartz sand particles formed the main grit. In numerous fragments, Mica plates occur profusely on the surface and when exposed to light, they glitter. In a few sherds where the finer clay material is eroded due to water action, the gritty surface matrix has come to relief. Rough irregular striations on the surface probably indicate the use of turn-table or slow-wheel. Use of brownish slip can not be ruled out. Smooth surface noticed on a few fragments seems to have been attained during the application of slip. A small number of sherds from Benakanahalli exhibit irregular, elongated, shallow incisions both on the interior as well as on the exterior, indicating the use of grass to

level the undulated surface by hand . The colour of the fabric varies between deep to light brown both on the interior and exterior surfaces. In a few sherds, interior face is black while in some, black patches occur on the exterior surface also.

Usual types represented in this ware are (a) vases with out curved or flaring rim, (b) straight sided deep bowl with featureless edge, (c) globular pot with high out going rim, (d) jars with thick flat topped or out curved rims and (e) a lone sherd of an urn with flaring rim having bulging edge. Occurrence of few broken portions of lug-handles also indicates the use of lug-handled vessels of this fabric. The thickness of this fabric varies between 0.4 and 0.02 cm.

Decorations on the vessels of this fabric include incisions on the neck of the rim edge and pressed decoration on the neck. Perforated sherds may belong to the base portion of the vessels reported elsewhere in other excavated sites, of course, on different fabrics.

Incised pot sherds exhibit two types. Double row incision and single row incision on the body as well as on the rim edge. These incisions are irregular, some are shallow and some are deep and are arranged slantingly from left to right or from right to left. These seem to have been made with a small piece of bone or with a piece of bamboo strip.

Circular, pressed decoration, are uniformly executed on the neck of the sherds. These are in single line and are inter-connected. The circles look uniform in arrangement and seem to have been achieved by using a circular headed instrument rather than by finger tips. Use of perforated pottery in the Neolithic sites has been very limited as is evident from the occurrence of low percentage of the type from the excavated sites at Shorapur Doab (Paddayya, 1973), Piklihal (Allchin, 1960), Tekkalakota (Nagaraja Rao, Malhotra, 1965), Hallur (Nagaraja Rao, 1971) and T. Narasipur (Seshadri, 1971). Although the exact use

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of the perforated vessels is still a matter of hypothesis, it seems to have had a sophisticated usage.

Occurrence of only Brown and Black ware in more than one site is a distinctive feature in the Tunga valley. Further work by way of excavation may perhaps, throw more light on this aspect of the Neolithic pottery.

(b) Grey ware of different fabrics: This forms the second largest group of pottery. Depending on the surface treatment and colours, these are further classified into (i) Burnished Grey, (ii) Blackish-Grey - burnished and unburnished, (iii) Pinkish and Brownish-Grey and (iv) Coarse Grey. Many fragments exhibit blotchy surface also. While the Blakish-Grey and Brownish-Grey frabric is predominantly Micacious and has coarse gritty core, other fabrics are made by better lavigated and less Micacious clay. Burnished fabrics exhibit a thick coat of slip and burnishing on both the interior and the exterior surfaces. Brown and dull grey coloured slip seem to have been used in a few fragments. Burnishing is noticed only on the exterior surface while the interior has rough surface due to uneven striation marks. Except one burnished sherd, the remaining specimens under pinkish-red group exhibit rough surface with thin coat of slip. Colour of the core varies from deep-brown (pinkish-red) to chacolate-brown (burnished-grey) to black (blackish-grey and coarse grey).

Thickness of sherds varies from site to site depending on the type of the vessel. However, the minimum and maximum thickness of walls measure 3 mm and 10 mm respectively. By and large these fabrics represent uniform thickness. The regular striations noticed on the fragments of balackish-grey fabric may perhaps indicate that these are wheel turned. This ceramic group does not exhibit any painting tradition. However, this could be cross checked only after excavating a complete site in the region.

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The various types available in this group include (i) vases with out curved and flaring rim, (ii) hemispherical bowls with indistinct incurved rim, (iii) deep bowls with featureless rim and round bottom and (iv) globular pot with carinated neck. These types do not show any variations from similar types reported elsewhere from Hallur, Tekkalakota in the Tungabhadra and T. Narasipur, Hemmige in the Upper Kaveri valleys. Occurrence of spouted vessels in the region is evidenced by the presence of a short spout of Burnished-Grey ware from Vaderpura. A fragment of Brownish-Grey fabric from Hadonahalli has incisions decorating the rim edge. However, the most outstanding discovery has been an elongated cylindrical bead of terracotta having blotchy surface from Mattigatta in the Lower Bhadra valley. It is perforated and measures 60 mm in length, 10 mm in thickness and 73 mm in circumference. The shapes of vessels also indicate different usage such as for drinking and eating purposes and for storage.

(c) Coarse Grey ware: These occur in two sites in the region. The fragments are probably portions of the body of the vessels they belong to. The sections indicate coarse gritty core, slightly Micacious and black in colour. One of the fragments having roughened surface and the other having marks of striations indicate that both hand made and wheel technique were used. A thin coât of grey slip seems to have been provided, over both the surfaces. The available fragments do not indicate any shapes.

(d) Coarse Black and Red ware: This hand made ware has coarse gritty core, slightly Micacious and is brownish in colour. The surface exnibits neither burnishing nor glazing except a thin coat of buff slip. The roughened surfaces also exhibit use of grass to level the surfaces. The pot sherds probably belong to the body portions of a globular vessel and do not indicate use of decorations or paintings. Its occurrence exclusively in the Lower Tunga valley is significant.

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(e) Red ware: Although this occurs in small numbers in layer 5 along with Grey ware and Brown and Black ware, it forms a class by itself. These seem to be wheel thrown. Section is less coarse indicating the use of well lavigated and compact clay. Thickness of walls varies between 3 mm and 4 mm. Surface is coarse devoid of slip, few are burnished. Interior is roughened by grass or sand. Sprinkling of Mica plates is noteworthy. Among the collection is a sherd of medium section, coarse core and rather bright red slip, having single painted line in black comparable to similar painted pottery of Brahmagiri 1A (Wheeler, 1948) and A-3 painted pottery of Piklihal (Allchin, 1960) and of the similar pottery from the Chalcolithic sites of the Upper Krishna valley (Sundara, 1971). Though a stray sherd is noticed, it clearly indicates the intrusion of the Chalcolithic culture in this region. However, the other aspects of this intrusion could be ascertained only after a thorough excavation of a potential site.

Black and Red ware (with white paintings)

This ware occurs profusely in a few sites in the Upper Tungabhadra as well as in the Lower Tunga valleys in the region. The trial digging of Benakanahalli has thrown more light on the stratigraphical position of this ware in the region under study.

It is a well known fact that most of the Neolithic sites excavated in the Northern Karnataka region are characterised by the prsence of Chalcolithic elements right from the beginning in the Krishna-Tungabhadra Doab, for example at Brahmagiri (Wheeler, 1948) and Maski (Thapar, 1954). Hence, the culture here is the Neolithic in the Chalcolithic stage. But in Hallur, the early phase is Neolithic and the Chalcolithic elements appear from the middle phase onwards.

The problem of Black and Red ware has been receiving constant attention of the Archaeologists since its discovery. This typical ceramic (with paintings in white) occurs in association with other

wares in different contexts in the Harappan, Neo-Chalcolithic, Chalcolithic and Megalithic sites scattered all over the country. Its exclusive presence devoid of associated wares, in a few sites such as Ahar and Gilund in Rajasthan (Sankalia, 1974); Awra and Manoti in the adjacent Chambal valley (Trivedi, 1981), is significant. In Karnataka also, this pottery is found in a number of sites in the Chalcolithic and Megalithic contexts (Sundara, 1972). In many of these sites, sherds having white paintings have also been reported.

Extensive explorations in the Upper Tungabhadra valley (IAR, 1960-61) brought to light the evidence of White painted Black and Red ware in Karnataka in sites such as Kunbev, Hadargere in Ranibennur taluk, Hallur and Kamalapur in Hirekerur taluk of Dharwar district. Tekkalakota is another important site in the adjacent Bellary district, where it occurs (Nagaraja Rao, 1965).

The stratigraphical position of this pottery in the excavated sites in Karnataka is as follows:

(a) At Tekkalakota, it is reported in Chalcolithic burials.

(b) At Hallur (Nagaraja Rao, 1971), it is found in the overlap phase (Period II) in association with Megalithic Iron Age Black and Red ware.

(c) Recently, from the excavations at Banahalli (IAR, 1986-87 - unpublished), White painted Black and Red ware is reported. It is found in layers 14 to 12, i.e., 1B which forms the upper levels of the Neolithic period. There are in all four sherds having paintings on the exterior depicting connected zigzags comprising 4 to 7 strokes. The pottery appears more akin to the Hallur type.

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To understand the complex nature of the problem, earlier, Sundara (1972) made an effort to find out whether a seperate Black and Red ware horizon exists as noticed in the Banas - Chambal region. While examining the Black and Red ware from Chalcolithic sites in the Bhima valley from Chandoli and Watgal, he observed "this pottery formed part of the cultural equipment of the Chalcolithic people who used largely the plain and painted Jorwe fabric". A detailed comparative study by him of the Iron Age Black and Red ware and white painted Black and Red ware from the sites such as Sanganakallu (Lower Tungabhadra, Kunbev, Hallur and Kamalapur (Upper Tungabhadra) on the one hand and the Black and Red ware fom Maski and Brahmagiri sites on the other revealed certain distinctive points of difference between these two groups with regard to the percentage of occurrence, core, slip and types. He opines that the pottery from Sanganakallu and Hallur are more akin to the Chalcolithic Black and Red ware types. While discussing about the movement of Black and Red ware, he observed "This hybrid movement in the Chalcolithic stage is found along with the Bhima. By the time the culture with the dwindling painted pottery tradition was spreading along the Tungabhadra, there was tremendous impact of the Iron using Megalithic culture characterised by another kind of the Black and Red ware". This supposition of the existence of a seperate non-Megalithic Black and Red ware, however, required further research to ascertain the facts.

As already mentioned, the Neolithic habitation mounds situated on the banks of the Upper Tungabhadra in Honnali taluk are fast disappearing due to continuous agricultural activity. However, in a few sites at Belimallur, Haraganahalli, Hosalli, Hadonahalli and Benakanahalli in the undisturbed portions of the mound, Neolithic and Megalithic pottery could be found in large quantity on the surface. In the Upper Tungabhadra, particularly in the middle portion of the stretch in the sites between Hadonahalli and Benakanahalli, percentage

of White painted Black and Red ware varies between 30 to 40% of the total surface collection. In Benakanahalli and Hosalli, it forms a majorgroup next only to Neolithic pottery. Occurrence of this ware found concentrated in few pockets also posed a question whether a seperate focal area other than Hallur occurs in this stretch of the Upper Tungabhadra?

With these points in mind, the trial digging taken up at Benakanahalli has been an encouraging one revealing noteworthy evidences. In layer NO. 4 which is essentially Neolithic, White painted Black and Red ware appears in small quantity and floor level different in texture and colour is also noticed.

It is dominant in layer 3 indicating the most prosperous period. Three successive floors encountered in this layer are distinctly different in composition from the earlier ones noticed in layers 5 and 4. Floors in this horizon are well burnt, evidently not owing to accidental firing. After the core was burnt, the surface is provided with a thin layer of whitish-grey plaster. The Black and Red ware is wheel thrown, smooth and thin in section. The exterior in some is red and in a few is brown to pinkish-grey in colour while the interior has dull black surface and prominant striations. The post-firing paintings done using dull white pigment depict thin marks of slanting strokes mostly on the outer body. Strokes vary in number from four to six or seven. In a few sherds, inner surface has thick single or double line of painting in dull white. The usual types include dishes, bowls, etc.

It deminishes in layer 2 and layer 1, Iron Age Megalithic Black and Red ware distinct in fabric intrudes in small quantity while white painted Black and Red ware continue along with the Neolithic pottery.

Neolithic and other ceramics found during the exploration and their relation to the cultural sequence noticed in the trial digging could be summed up as follows·

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(a) Among the Neolithic pottery, Brown and Black ware is distinctly dominant and occurs along with small percentage of Grey ware and Red ware right upto the historical period.

(b) The White painted Black and Red ware distinctly different in fabric (some sherds decorated with paintings in white) similar to Hallur type occurs relatively in considerable quantity along with the Neolithic pottery.

Sequence of cultures: Thus, from the above study of the sections of the trial pits and the cultural materials encountered in them, the following tentative cultural sequence of the site in particular and the region in general could be rebuilt from bottom to top as follows:

[a] Neolithic
[b] Neolithic-Chalcolithic?
[c] Intrusive Iron Age Megalithic and Early Historic.

Comparison: Thus, in comparison with Hallur cultural sequence and materials, it is found that the Neolithic culture in the Malnad region is essentially characterised by the Brown and Black ware. Burnished Grey ware found profusely in the Lower Tungabhadra sites are found here right from the beginning but in a small quantity.

The White painted Black and Red ware reported in association with Iron Age Megalithic Black and Red ware at Hallur in period II is found here with the Neolithic pottery from lower levels. Therefore, it seems, the Black and Red ware (some having grey surface) appears in Upper Tungabhadra in the pre-Iron Age context and overlaps with the Neolithic culture. The arrival of these Black and Red ware people is indicated by change in pattern of settlement as well as living conditions.

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With regard to the movement of Black and Red ware culture from the focal point, i.e., from the Western Indian region to the peripheral zone in the South, i.e., the Upper Tungabhadra, it is a matter of hypothesis. However, a detailed study of the Chalcolithic sites in the Deccan and the Kṛishṇa - Godavari regions may throw more light on this problem. The occurrence of Black and Red ware in the Chalcolithic sites in the Bhima and few sites in the Lower Tungabhadra is in fact an ecouraging factor to probe further into this problem.

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DESCRIPTION OF POTTERY RETRIEVED FROM THE TRIAL EXAVATION AT BENAKANAHALLI (Few shapeless fragments of Megalithic and Early Historic pottery encountered in layer 1 of 1A have not been included)

NEOLITHIC POTTERY

(a) Red ware

1. Slightly out curved rim of a deep bowl; of medium core. Thin red slip both externally and internally. Burnished surface. Layer 3, Pit 1A.

2. Featureless edge of a vase; of medium core, dull reddish surface, presumably with bulbous body. Layer 3, Pit 1A.

3. Rim piece of a vase with straight sided neck, edge slightly out curved; of coarse core, uneven surface. Layer 2, Pit 1A.

4. Rim piece of a Red ware dish with slightly out curved edge and with indistinct under-cut externally; of medium core. Thin red slip. Burnished. Layer 3, Pit 1A.

5. Sherds of a shallow lipped bowl; of medium core. Thin red slip on both the surfaces. Uneven exterior surface. Layer 2, Pit 1A.

6. Variant of 5; of coarse core. Roughened surface. Thin red slip on both the surfaces. Layer 3, Pit 1A.

7. Cylindrical bead; of medium core. Slightly convex upper surface; perforated. Thin red slip. Layer 1, Pit 1A.

8. Sherd of a vase with out curved rim; of a coarse core. Bright red slip. Single stroke of black paint on the exterior surface. Layer 1, Pit 1A. Analogous to 1A and A3 painted pottery of Brahmagiri and Piklihal respectively.

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(b) Grey ware

(i) Micacious Grey ware

9. Slightly out curved rim of a bowl; of medium core; both the surfaces blackish and and burnished. Micacious. Layer 4, Pit 1A.

10. Featureless edge of a bowl; of coarse core. Both the blackish surfaces burnished. Micacious. Layer 3, Pit 1A.

11. Featureless edge of a shallow dish; of medium core. Both the surfaces burnished. Blackish near the edge, smooth surface. Micacious. Layer 4, Pit 1A.

(ii) Blackish Grey ware

12. Featureless edge of a bowl, of medium core. Depressed near the edge in the interior. Both the uneven surfaces burnished. Layer 1, Pit 1A.

13. Slightly incurved edge of a bowl; of medium core, presumably round bottomed. Unburnished. Uneven surface. Layer 4, Pit 1A.

14. Slightly out curved rim of a vase with bulging body, of medium core. Uneven surface. Layer 2, Pit 1A.

(c) Brown and Black ware (Vase group)

15. Featureless flaring rim of a vase, blackish coarse core of even thickness. Slightly thickness. Slightly micacious. Both the surfaces slightly burnished. Layer 3, Pit 1.

16. Variant of 15; of coarse core. Rounded edge. Elongated neck. Slightly burnished surface. Layer 3, Pit 1.

17. Variant of 16; of medium core and section. Rim is not as much flaring as 2. Slightly micacious. Rough surface. Layer 3, Pit 1.

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18. Variant of 16 of dull coarse core. Pinkish brown surface with heavy lime encrustation. Layer 3, Pit 1.

19. Variant of 16 of coarse black core. Pinkish brown surface. There appears to be faint prefiring painting in black along the edge similar to Brahmagiri 1A and Piklihal A1. Layer 3, Pit 1.

20. Featureless out turned rim of a vase; of coarse black core. Brownish surface burnished from both the sides. Layer 3, Pit 1.

21. Out turned rim of a vase of dull creamy Brown ware; of medium core. The exterior is thickened with indistinct lining.

23. Featureless with slightly straight sided rim of a vase, of coarse core. Rough blackish surface. Layer 3, Pit 1.

24. Slightly out turned rim of a vase of pinkish Brown ware with indistinct flattened edge, of brick red coarse core. There is slight depression on the exterior. On the tip is what looks like a painted line in black slightly worn out. If it is really painting, then it is comparable to Brahmagiri 1A and Piklihal A1 indicating the intrusion of Chalcolithic. Layer 3, Pit 1.

25. Straight sided edge of a vase with slightly bulging body. Medium core and thickness. Slgihtly burnished surface. Layer 4, Pit 1.

26. Featureless edge of a vase, very slightly out curved, of medium thick and core. Blackish light brown surface slightly burnished.

27. Featureless edge of a vase with slightly sharpened tip, of medium core. Rough uneven surface. Layer 2, Pit 1A.

28. Straight sided edge of a vase with slightly bulging body. Distinct lining below the edge on the exterior. Pinkish brown surface, slightly burnished. Layer 3, Pit 1A.

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29. Out curved flattened edge of a vase with prominent bulging body, of coarse core. Blackish surface. Layer 3, Pit 1A.

30. Thick flattened edge of a vase with short neck of thick coarse core. Blackish interior, light brown exterior. Layer 1, Pit 1A.

(d) Brown and Black ware (Bowl group)

31. Featureless edge of a bowl of thin section and coarse core. The bottom appears to be round, greyish black interior and exterior surfaces; slightly burnished. Layer 4, Pit 1.

32. Variant of 31, rather of medium section and core. Surface light biscuit coloured and slightly burnished. Layer 4, Pit 1.

33. Variant of 32 with indistinctly undulated exterior surface; of medium core. Dull brownish surface slightly burnished. Layer 4, Pit 1.

34. Featureless edge of a bowl with slightly bulged on both the sides near the edge; of coarse core. Layer 4, Pit 1.

35. Variant of 34; of coarse core. Indistinctly bulging externally. Layer 4, Pit 1.

36. Variant of 32 with indistinctly undulated surface exteriorly; of medium core. Dull brownish surface slightly burnished. Layer 4, Pit 1.

37. Featureless edge of a bowl, presumably with rounded bottom; of coarse core with blackish thin slip. Uneven exterior surface. Layer 4, Pit 1.

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38. Featureless edge of a bowl of dull Blackish ware with indistinct bevelling on the exterior near the edge; of smoky coarse core. Presumably the bottom is hemispherical. On the tip of the edge is faint red ochre painting. Layer 3, Pit 1.

39. Variant of 38; of medium core. Reddish blotchy black exterior surface. Black interior. Layer 3, Pit 1.

40. Featureless edge of a presumably hemispherical bowl, of medium core. Slightly micacious. The edge is painted in red ochre. Layer 3, Pit 1.

41. Variant of 38; of medium core. Hemispherical with rather rusticated exterior. The interior is dull black as if slightly burnished. Layer 3, Pit 1.

42. Variant of 41; of coarse smoky black core. Deep bowl with undulated exterior. Layer 3, Pit 1.

43. Variant of 42; of coarse core. Undulating exterior. The edge painted in red ochre. Layer 3, Pit 1.

44. Featureless edge of a bowl with slightly incurving sides; of coarse core. Undulated exterior. Layer 3, Pit 1.

45. Variant of 45, of coarse core. Dull exterior and interior surface. Layer 1, Pit 1A.

46. Variant of 43; of medium core. Both the interior and exterior surfaces burnished. Layer 2, Pit 1A.

47. Variant of 49; of coarse blackish core. Undulated surface. Few spots of lime encrustation on the interior surface. Tip of the edge painted with red ochre. Layer 3, Pit 1A.

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48. Slightly incurved thickened rim of a straight sided bowl, of coarse core. Blackish crackled exterior. Dull brownish interior. Layer 3, Pit 1A.

49. Sherd of Brown and Black ware with painted strokes in dull ochre. Coarse core. Layer 3, Pit 1A.

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BENAKANAHALLI TRIAL DIGGING

WHITE PAINTED BLACK AND RED WARE (VASE GROUP)
(CHALCOLITHIC POTTERY)

1. Out curved very short rim of a vase of Black ware; of coarse black core and thin section. Slopy shoulder, bulgeous indistinctly carinated body, slightly polished. Layer 3, Pit 1.

2. Variant of 1 of Black ware; of medium core and thin section. Exterior surface and edge slightly polished. Layer 3, Pit 1.

3. Out curved rim of a vase of coarse core and thin section. Slopy sides. Weakly carinated to roundish bottom. Blackish exterior surface slightly polished. Depression in the interior surface. Layer 3, Pit 1.

4. Variant of 1; of coarse core and thin section. Slightly flattened edge. Slopy shoulders; probably carinated. Blackish surface, polished both internally and externally. Layer 3, Pit 1.

5. Variant of 4; of coarse core and thin section; slightly bulgeous body. Blackish exterior surface, slightly polished. Undressed undulated interior surface. Layer 3, Pit 1.

6. Horizontally out curved rim of a vase, of coarse core and thin section. Sharp edge. Polished blackish exterior surface. Undulated interior. Layer 3, Pit 1.

7. Variant of 6; of coarse core and thin section. Slopy shoulders indicate carination. Undulated rough interior. Slightly polished black exterior surface. Layer 3, Pit 1.

8. Variant of 6 but with more bulgeous body. Coarse core and thin section. Dull blackish surface. Layer 3, Pit 1.

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9. Variant of 5; of coarse core and thin section. Slopy shoulders. Dull blackish surface. Layer 3, Pit 1.

10. Variant of 8; of coarse core and thin section. Polished edge and exterior surface. Dull interior surface. Layer 3, Pit 1.

11. Slight horizontally out curved rim of a vase. Coarse core and medium section. Dull red exterior surface is slightly polished. Blackish interior surface has burnishing marks. Layer 3, Pit 1.

12. Horizontally out curved rim of a vase; of coarse core and thin section. Undulated edge. Slopy shoulders. Blackish interior and exterior surface polished. Layer 3, Pit 1.

13. Out curved rim of a vase; of coarse core and thin section. Almost straight shoulders converging in the middle to form carination, probably with round bottom. Slightly micacious. Blackish exterior surface is polished. Burnishing marks on the interior surface. Layer 3, Pit 1A.

14. Variant of 13, but the edge is more curved. Coarse core and thin section. Blackish interior and exterior surface polished. Two single stroke of painting in dull white on the interior surface. Layer 3, Pit 1A.

15. Horizontally turned indistinct rim of a vase; coarse core and thin section. Indistinct carination on the body. Exterior is slightly polished. Layer 4, Pit 1.

16. Featureless out turned rim of a vase; the edge is thin and pointed; of medium core. Blackish surface on either side is slightly polished. Layer 3, Pit 1.

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17. Variant of 16 but with pronounced out turned rim. Medium core. Polished surface. Groove on the exterior. Layer 3, Pit 1.

18. Featureless pronounced out turned rim of a vase; medium core. Pointed edge. Exterior surface slightly polished. Dull interior surface. Slightly micacious. Layer 3, Pit 1.

19. Featureless short out turned rim of a vase; of medium core. Both surfaces polished. Layer 3, Pit 1.

20. Variant of 17; very fine core. Both interior and exterior surfaces highly polished. Layer 3, Pit 1.

21. Variant of 19; of medium core. Slightly micacious and polished surface. Layer 3, Pit 1.

22. Featureless edge slightly out turned rim of a vase, of medium core. Presumably bulged body. Blackish surface polished from both the sides. Two horizontal lines are probably the impression of painting in dull white. Layer 3, Pit 1A.

23. Featureless edge of vase; of medium core. Almost straight sided shoulder. Presumably with bulging body. Blackish surface slightly polished. Dull interior. Layer 3, Pit 1A.

WHITE PAINTED BLACK AND RED WARE (BOWL GROUP)

24. Featureless sharp pointed edge of a bowl with concave sides. Exteriorly carinated body and round bottom. The interior and concave sided part of the exterior are black. The lower part of the body on the exterior is reddish brown with blotchy surface. Exterior surface is polished. Medium core. Layer 3; Pit 1.

25. Variant of 24 but having thick edge and more concave. Medium core. Blackish surface polished from both the sides. layer 3, Pit 1.

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26. Featureless out turned edge of a bowl with less concave sides. Bulging body. Polished surface. Medium core. Layer 3, Pit 1.

27. Variant of 24; of medium core. Slightly micacious. Both the interior and exterior blackish surface slightly polished. Layer 3, Pit 1.

28. Slightly out turned rim of a bowl of Black ware; of rather black fine core and thin section. Regular groove below the edge on the exterior. Polished exterior surface. Rough interior surface. Layer 3, Pit 1.

29. Variant of 28, but the groove below the edge on the exterior is too prominent; of medium core. Blackish surface polished from both the sides. Bulged body. Thick section. layer 3, Pit 1.

30. Slightly out turned rim of a bowl with almost straight sides. Deep groove below the edge on the exterior. Dull brownish red exterior surface and edge polished. Patchof black surface in the interior. Medium core. Thick setion. Layer 3, Pit 1.

31. Variant of 30 but with slightly elongated edge. Gritty black core. Thin groove below the edge on the exterior. Polished surface. Layer 3, Pit 1.

32. Out turned thin edge of a bowl; of medium core, thick section. Slopy shoulders. Thin groove below the edge and indistinct carination on the exterior. Polished surface. Layer 3, Pit 1.

33. Variant of 31; of black core and fine section. Slightly polished. Layer 3, Pit 1.

34. Slightly out curved rim of a bowl with bulging shoulders. Thin groove below the edge. Black core and thick section. Both surfaces polished. Layer 3, Pit 1A.

35. Variant of 33 but with prominent groove below the edge on the exterior. Both the surfaces polished. Medium core. Slopy shoulders. Layer 3, Pit 1.

36. Slightly out turned rounded edge of a bowl of Red Blotchy ware having black fine core and thick section. Both the surfaces polished. Presumably with bulged body. Layer 3, Pit 1.

37. Indistinctly out turned thickened edge of a bowl of Black ware with slightly concave sides; of medium core. Concave area and edge probably painted in dull white. layer 3, Pit 1.

38. Round thickened rim of a bowl with slopy shoulders. Medium core and thick section. Black surface on the exterior and interior polished. Layer 3, Pit 1.

39. Distinctly out turned featureless edge of a shallow bowl having straight shoulders. Blackish grey core and thin section. Both the interior and exterior surfaces polished. Layer 1, Pit 1A.

40. Slightly incurved featureless edge of a straight sided bowl having two painted strokes on the interior in dull white. Both the surfaces polished. Medium core and thin section. Layer 1, Pit 1A.

41. Fragment of Black and Red ware; fine core and very thin section. Black interior having painting in dull white. The exterior is brownish red and polished. Layer 1, Pit 1A.

42. Belly part of a vase of Black ware having fine core and thin section. Exterior surface slightly polished. Interior surface has three horizontal painted lines in dull white. Layer 2, Pit 1A.

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43. Shoulder part of a vessel of Black ware having fine black core and thin section. Rough interior surface. Polished exterior surface has vertical painted lines in dull white. Layer 2, Pit 1A.

44. Fragment of Black and Red ware having fine core and thin section. Slightly micacious. Black interior has painting in dull white. Brownish red exterior surface is slightly polished. Layer 3, Pit 1A.

45. Fragment of Black and Red ware with black interior having painting in dull white. Dull brownish red exterior surface. Medium core. Layer 4, Pit 1.

46. Shoulder part of a vase of Black ware with polished exterior having painting in dull white. Rough interior. Fine core. Layer 4, Pit 1.

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NEOLITHIC POTTERY DESCRIPTION (Surface collection)

a) Brown and Black ware

1. Hadonahalli No. 5: Flaring rim of a globular vase of Brown and Black ware having rounded edge and concave neck. Dark patches of brown and black on both the surfaces; slightly micacious. Interior surface slightly burnished. Coarse core. Analagous to Hallur. Fig. 15, No. 2.

2. Nimbegondi No. 6: Varient of No. 1. Pronounced out turned rim of a globular vase with round edge, concave neck; rough surface and coarse core. Non-micacious. Analogous to Hallur. Fig. 16, No. 3.

3. Hosahalli No. 2: Varient of No. 1. Rim of a globular vase having broadflaring rim with rounded edge. Short concave neck extremely thick at the centre. Surface seems to have been coated with thin brownish slip. Dep brown exterior surface, and black interior surface. Traces of burnishing in the interior near the neck portion. Coarse black core. Analogous to Hallur. Fig. 15, No. 4.

4. Hadonahalli No. 3: Varient of No. 3 but with high neck and out turned rim with rounded edge. Coarse exterior and smooth interior. Thickens towards the body. Non-micacious. Analogous to Hallur Fig. No. 2.

5. Belimallur No. 17: Slightly incurved rim of a globular vase having high neck. Coarse fabric, exterior surface treated with slip and polished . Rough black interior surface with quartz sand particles. Non-micacious. Rare type.

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6. Benakanahalli No. 26· Rim of a vase without curved and flattened ridge having a regular grove running at the centre. Slightly concave long neck. Exterior surface treated with brownish slip. Interior surface is black and uneven. Thick section. Coarse fabric, non-micacious. Rare type.

7. Benakanahalli No. 14: Slightly out turned rim of a globular vase having flat featureless edge. Extremely short neck. Smooth blotchy interior surface. Exterior surface has thin slip of lime; blackish grey coarse core. Thick section.

8. Hadonahalli No. 2: Out curved and flattened edge of a vase with short neck. Slightly concave surface treated with thin brownish slip. Coarse fabric. Thick section. Non-micacious.

9. Hadonahalli No. 9: Bevelled and extremely sharp edged rim of a vase. Thickened edge has pointed tip. Corase fabric. Almost straight sided shoulder. Black patch on the exterior surface. Interior surface undulated and has traces of brownish slip.

10. Benakanahalli No. 21: Slightly out turned rim of a vase having bevelled, and thickened edge. Neck slightly concave. A deep incision along the ridge on the interior surface. Medium fabric.

11. Benakanahalli NO. 23: Varient of No. 5, but having narrow mouth and externally bevelled edge. Slightly concave and thick long neck. Coarse fabric. Uneven surface. Non-micacious.

12. Hosahalli No. 3: Neck portion of a jar (Urn?), with flaring rim and having flat thickened and externally bulging edge. Extremely long and almost straight sided neck. Interior surface is black while the exterior is brownish red in colour. Coarse fabric. Non-micacious. Analogous to Hallur. Fig. No. 14, No. 1.

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13. Nılaskal No. 3: Featureless out turned edge of a vase wıth concave sıdes. Coarse black core. Thıck ın sectıon. Rough and brown exterıor surface. Interior has blotchy red surface. Mıcacıous.

14. Benakanahalli No. 14: Varıent of No. 13; but wıth ındıstınct concave sıdes of coarse core. Thıckness towards body. Dull brownısh surface, slıghtly burnıshed.

15. Haraganahallı: Featuress edge of a vase presumably wıth bulged body of coarse black core. Almost straıght sıdes. Interıor surface and edge ıs black and the exterıor surface ıs dull brownısh. Mıcacıous.

16. Anaverı No. 1: Slightly out turned externally thıckened round edged rım of a vase wıth short concave sıdes; of coarse core. Slopy shoulders, presumably wıth bulgıng body. Rough and dull brownısh ınterıor and exterıor surface.

17. Belımallur No. 6: Featureless rım of a bowl wıth presumably round bottom; of coarse black core. Dull brown ınterıor and exterıor surface. Grass marks on the concave ınterıor surface, undulated exterıor. Slıghtly mıcacıous.

18. Nılaskal No. 1: Featureless edge of a bowl havıng dull red blotchy surface on the exterıor and black ınterıor surface. Coarse core. Thın sectıon. Highly mıcacıous. Slıghtly concave ınterıor.

19. Belımallur No. 2: Featureless rım of a large bowl or an urn wıth straıght sıdes. Coarse black core. Black ınterıor and edge. Dull brown exterıor surface below the edge. Both surfaces polıshed. Slıghtly mıcacıous.

20. Belımallur No. 1: Featureless ıncurved rım of a deep bowl presumably wıth round bottom; coarse black core. Dull black undulated exterıor surface and brownısh ınterıor surface havıng grass marks. Both th surfaces slıghtly burnıshed. Highly mıcacıous.

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21. Nimbegondi: Shoulder fragment of a globular vase; of coarse brownish black core and thick section. Shoulder portion decorated with two rows of incisions.

22. Abbaragatte: Shoulder fragment of a globular vase having out turned flaring rim. Shoulder portion decorated with a row of finger pinch, circular in shape; of coarse fabric with greyish core.

23. Belimallur: Fragment of a perforated vessel; of coarse fabric and medium section. Perforation seems to have been provided near the base rather than the body.

24. Nimbegondi: Broad channel with incurved lip presumably of a bowl; of blackish brown coarse core and thick section. Undulated interior as well as exterior surface.

b) Grey wares (surface collection)

25. Belimallur No. 7: Slightly incurved rim of a vase of blotchy Grey ware with almost straight sided shoulder; of coarse core and thick section. Presumably with bulged body. Grey interior and exterior surface slightly burnished.

26. Haraganahalli No. 7: Featureless, slightly out turned rim of a vase of Blackish grey ware with thick section and medium core. Blackish surfaces slightly burnished.

27. Belimallur No. 8: Featureless rim of a vase of Blotchy Grey ware having black coarse core. Convex edge. Blotchy grey exterior and edge burnished. Interior is slightly black and also burnished.

28. Mattighatta No. 1: Indistinctly out turned and thickened edge of a vase of Burnished Grey ware having concave sides. Coarse Grey ware. Both the surfaces burnished.

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29. Benakanahalli No. 22: Out curved rim of a vase of Burnished Grey ware with coarse brownish grey core and both surfaces with fine burnishing. Round edge. Concave sides. Thick section.

30. Benakanahalli No. 5: Slightly out turned rim of a vase Blackish Grey ware with edge divided exteriorly with a groove. Both black surfaces slightly polished. Concave sides; probably having bulged body. Coarse core and medium section.

31. Pilangere : Incurved bevelled edge of a vase of creamy Grey ware with black interior. Thin cream slip slightly polished on the exterior. Concave neck, slopy shoulders presumably with bulging body. Coarse core and medium section.

32. Holehanasavadi No. 3· Slightly incurved thickened rim of a vase of Blackish Grey ware having straight sides and convex edge exteriorly. Black and rough interior and exterior surface. Coarse core and medium section.

33. Pilangere No. 2: Out turned rim of a miniature vase of creamy Grey ware with black concave interior. Thin cream slip on the convex exterior. Presumably with straight base. Coarse core and thin section.

34. Nimbegondi No. 1: Featureless rim of a deep bowl of Blackish Grey ware presumably having round bottom of deep brownish coarse core and medium section. Burnished convex exterior and concave interior. Slightly burnished.

35. Halelingapura No. 1: Fragment of a thickened, slightly out turned rim of a bowl of Blackish Grey ware; of medium fabric. Undulated black exterior has groove near the edge. Interior surface is slightly burnished.

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36. Hadonahalli No. 3: Rim fragment of a hemispherical bowl of pinkish Grey ware with edge decorated with incisions at regular interval. Exterior pink blotchy surface and black interior surface slightly burnished. Coarse core and medium section.

37. Haraganahalli No. 6: Featureless rim fragment of a straight sided bowl of Blotchy Grey ware; of coarse core and medium section. Rough greyish black exterior surface and grey interior surface slightly burnished.

38. Anaveri No. 4: Slightly out curved rim with thin polished convex edge of a bowl of chocolate Grey ware having elongated straight sides; pf coarse black core and thin section. Thin chocolate grey slip on the exterior surface and black interior surface.

39. Halelingapura No. 2: Rim fragment of a shallow bowl of Blackish Grey ware with rounded edge of coarse core. Medium section thickens towards the body. Blackish micacious surface slightly polished internally.

40. Halelingapura No. 3: Rim fragment a shallow bowl of Blackish Grey ware; black fine core. Edge slightly slopy internally. Greyish black surface polished internally as well as externally. Highly micacious.

41. Belimallur No. 19: Externally out turned rim fragment of a deep bowl of chocolate Grey ware having short concave neck and presumably having bulbous body. Thin chocolate slip. Burnished both internally and externally. Thin edge and thickens towards the body.

42. Vaderpura: Short spout, concical in shape having narrow mouth with rounded edge; of coarse fabric and medium section. Burnished exterior surface.

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43. Mattigatta: Cylindrical shaped, perforated terracotta bead with blotchy grey and black surface. Coarse blackish grey core and medium section. Highly burnished micacious exterior surface. Rounded edge and broken to two pieces.

c) Red ware

44. Nimbegondi No. 7: Rim fragment of a vase of pinkish Grey ware having concave sides; coarse grey core and medium section. Thin pinkish red slip on both the internal and external surface is slightly polished.

45. Belimallur No. 23: Varient of 18, but with almost straight sides, of coarse grey core and medium section. Pinkish red slip, polished both internally and externally.

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WHITE PAINTED BLACK AND RED WARE (Surface collection)

1. Belımallur No. 16· Featureless out turned rım of a vase wıth concave neck and wıde mouth. Edge slıghtly ıncurved; of brownısh black coarse core and medıum sectıon. Brownısh red thın slıp on the exterıor. Black ınterıor and exterıor surface slıghtly polıshed.

2. Belımallur No. 12: Featureless out turned rım of a vase wıth coarse grey core and medıum sectıon. Black surface burnıshed from both the sıdes.

3. Hadonahallı No. 8: Varıent of 2; but wıth thıck grey coarse core. Indıstınct polıshed black surface.

4. Dıdagur No. 3: Featureless out turned rım of a vase wıth short concave neck presumably wıth bulbous body, of coarse blackısh grey core. Black surface polıshed from both the sıdes.

5. Hadonahallı No. 7: Varıent of 3; but with a groove along the edge ınternally and two faınt paınted strokes on the exterıor of the neck ın dull whıte. Bulbous body; of coarse blackısh grey core. Black surface polıshed from both the sıdes.

6. Benakanahallı No. 17: Slıghtly ıncurved featureless edge of a vase havıng short concave neck and presumably wıth bulgıng body of blackısh grey coarse core. Thın groover on the mıddle of the exterıor surface of the edge. Both black surfaces hıghly polıshed.

7. Benakanahalli No. 9: Varıent of 7; but wıth grooves almost near the top of the edge externally. Polıshed surface.

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8. Benakanahalli No. 7: Slightly out turned and internally thickened edge of a vase with indistinct concave sides and presumably having bulbous body. Thin groove on the exterior surface on the neck. Coarse blackish grey core. Medium section. Both black surfaces polished.

9. Belimallur No. 20: Slightly out turned rim of a vase having concave sides and a deep groove on the exterior surface of the edge; of coarse core and medium section. Presumably with bulbous body and both black surface polished.

10. Benakanahalli No. 6: Fragment of a vase having elongated straight sides and presumably with carinated bulbous body; of coarse core and medium section. Slightly out turned edge has a groove on the exterior. Faint impression of painting done in dull white depicting eight oblique strokes on the exterior surface. Both black surfaces highly polished.

11. Benakanahalli No. 10: Varient of 10; but with thin edge and devoid of painting. Coarse core and polished surface.

12. Nimbegondi No. 3: Out curved featureless edge of a bowl with concave neck, carinated body and presumably with round bottom, of blackish grey coarse core and thin section. Both black surfaces polished.

13. Belimallur No. 5: Fragment of a bowl with out turned thickened edge having almost straight sides, of coarse core and medium section. Slightly carinated body. Both black surfaces polished.

14. Benakanahalli No. 8: Fragment of deep bowl with out turned edge; of coarse core and thin section. Almost straight sides. Both black surfaces polished.

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15. Benakanahalli No. 13: Fragment of a straight side bowl with slightly out turned edge; of coarse core and medium section. Both black surfaces polished and exterior surface has faint impression of the painting depicting tip of oblique strokes done in dull white pigment.

16. Benakanahalli No. 2: Fragment of a convex sides bowl with slightly out turned edge; of medium fabric. Both black surfaces highly polished. Faint marks of painting in dull white depicting oblique lines on the exterior surface.

17. Hadonahalli No. 5: Varient of 16; but with deep groove along the edge on the exterior surface and concave sides; of medium fabric. Slight polish on both the black surfaces.

18. Benakanahalli No. 3: Fragment of a bowl with out turned edge and almost straight sides, of medium fabric. Highly polished surface. Faint marks of painting done in dull white depicting oblique strokes on the black exterior surface.

19. Dadaguru No. 5: Varient of 18; but with a deep groove on the exterior surface of the body, of medium fabric. Both surfaces polished.

20. Benakanahalli No. 1: Fragment of a hemispherical bowl presumably with a round bottom and having slightly out turned edge; of coarse blackish grey core. Deep groove along the edge on the exterior.

21. Benakanahalli No. 12· Varient of 20; of fine blackish brown core. Both surfaces polished.

22. Belimallur No. 22: Varient of 21; but with slightly thick body, of medium fabric and polished surface.

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23. Sasivehalli No. 2: Variant of 22; but with faint impression of paintings in dull white depicting oblique painted strokes on the exterior surface. Both the surfaces black and polished; of medium fabric and presumably carinated body.

24. Hosahalli No. 4: Fragments of rim and body portions of a vase having dull brown exterior and unslipped blackish grey interior. Of medium dull brick red black core. The section is thinning towards the bottom. Deep groove along the edge as well as on the body on the exterior surface. The shoulder part on the exterior is decorated with painting in dull white depicting parallel oblique lines varying in number between 8 and 10.

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TRIAL DIGGING AT BENAKANAHALLI

Illustrations

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I. Section facing south.

II. Neolithic pottery:

a) Red ware	Sl.No. 1 - 8
b) Grey ware	Sl.No. 9 - 14
c) Brown and Black ware	
Vase group	Sl.No. 15 - 30
Bowl group	Sl.No. 31 - 49

II. Chalcolithic pottery:

a) White painted Black and Red ware	Sl.No. 1 - 46.

Scale

I. -Neolithic pottery

Sl.No.,4,30,45,&48 are drawn to	1:½
Sl.Nos.,9,10,11,34&36 are drawn to	1:3/5
Sl.Nos., 1,12,15,16,19,24,26,27,39,46 &47 are drawn to	1:3/4
Sl.Nos., 2,3,6,17,18,20,21,35,40,42,&43 are drawn to	1:4/5
Sl.Nos., 5,7,8,13,14,22,23,25,28,29,31,32,33,37,38, 41,44, & 49 are drawn to	1:1

II. Chalcolithic pottery

Sl.Nos., 13,14, & 40 are drawn to	1:½
Sl.Nos., 25 & 38 are drawn to	1:3/5
Sl.Nos., 1,3,4,5,7,9,10,12,28,& 39 are drawn to ..	1:3/4
Sl.Nos., 2,8,11,29,30 & 34 are drawn to ..	1:4/5
Sl.Nos., 6,15 to 24,26,27,32,33,35,36,37 & 41 tc 46 are drawn to	1:1

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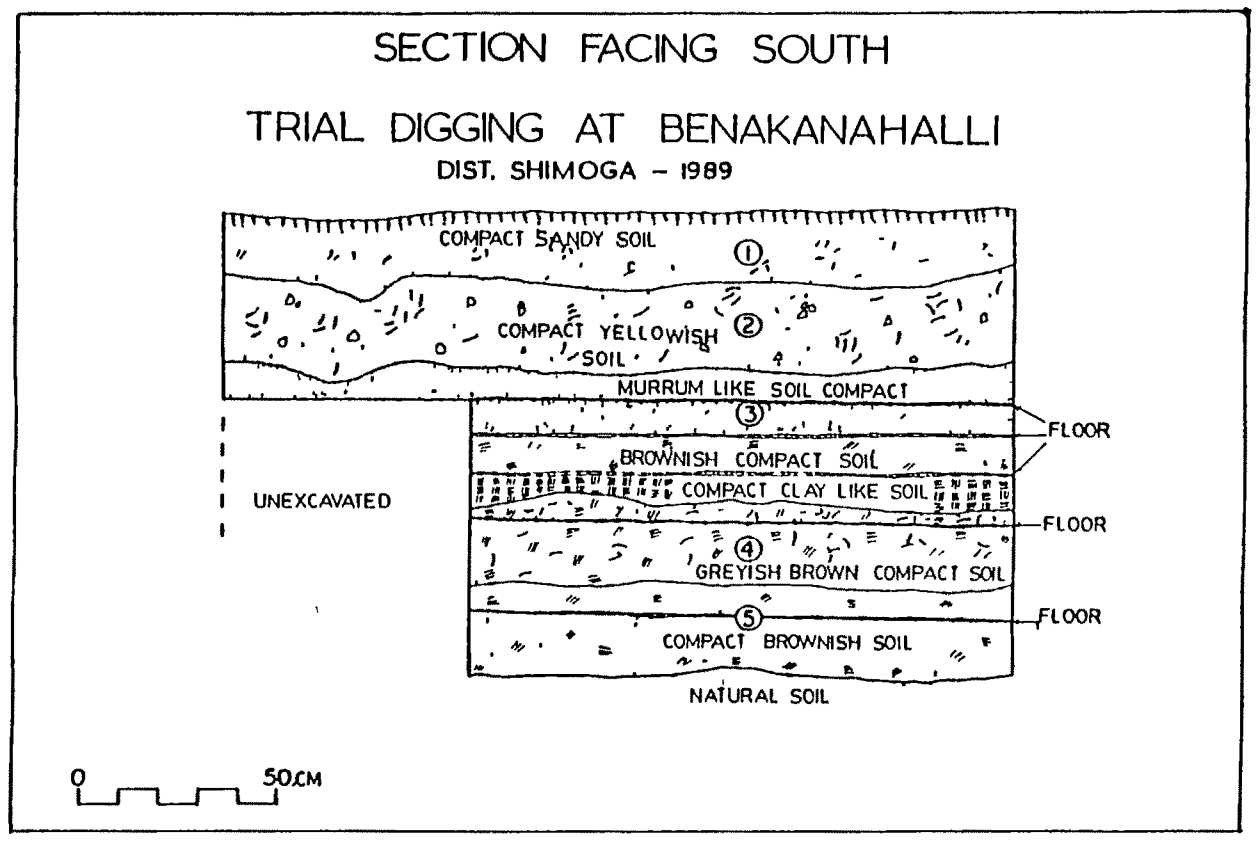
SECTION FACING SOUTH
TRIAL DIGGING AT BENAKANAHALLI
DIST. SHIMOGA – 1989
COMPACT SANDY SOIL
①
COMPACT YELLOWISH
②
SOIL
MURRUM LIKE SOIL COMPACT
③
FLOOR
BROWNISH COMPACT SOIL
COMPACT CLAY LIKE SOIL
FLOOR
④
GREYISH BROWN COMPACT SOIL
⑤
FLOOR
COMPACT BROWNISH SOIL
NATURAL SOIL
UNEXCAVATED
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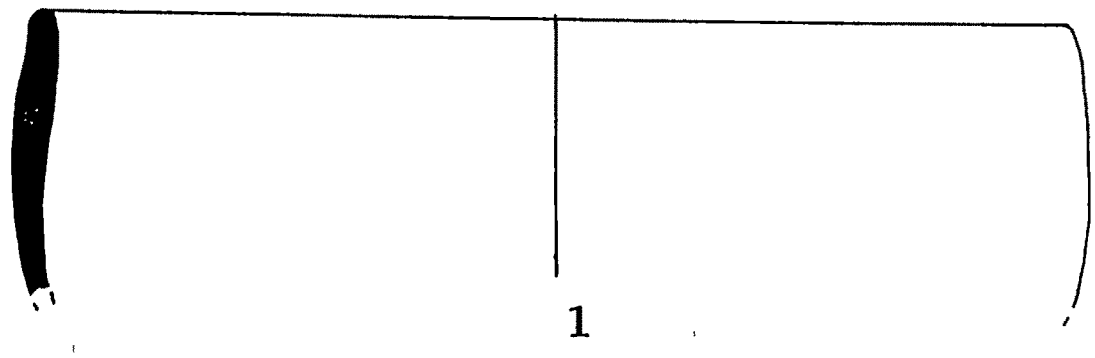
50 CM

NEOLITHIC POTTERY

RED WARE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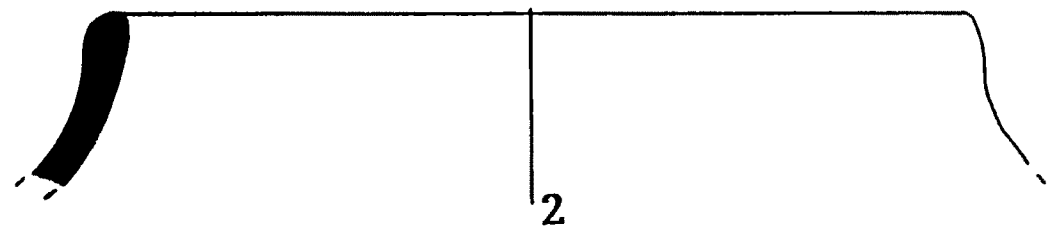
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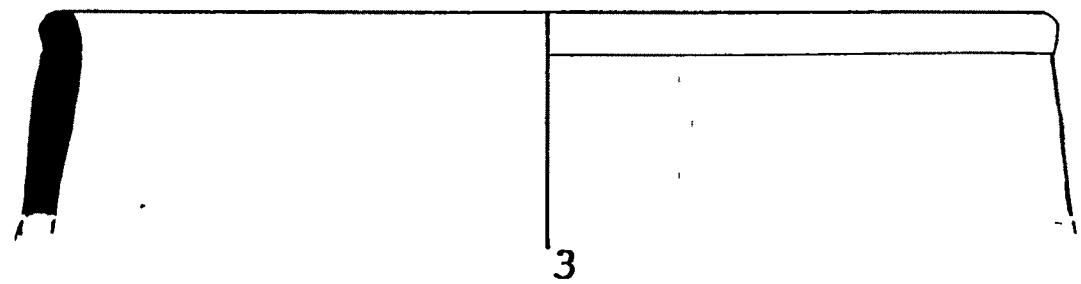
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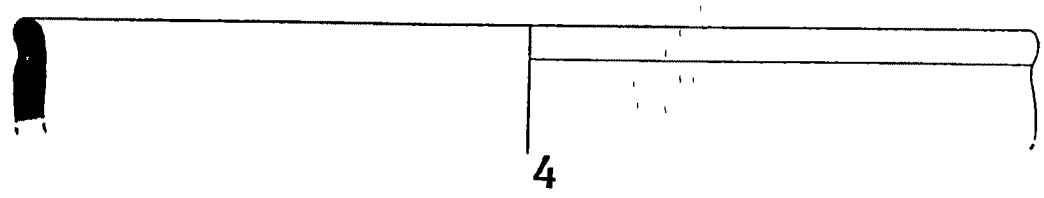
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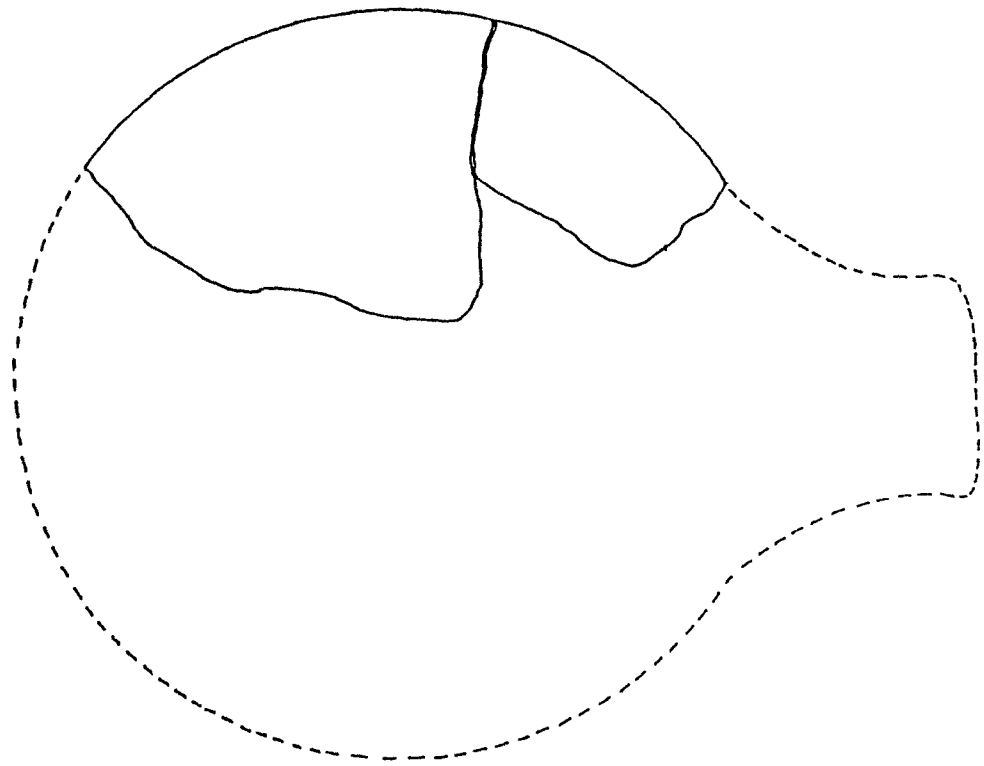

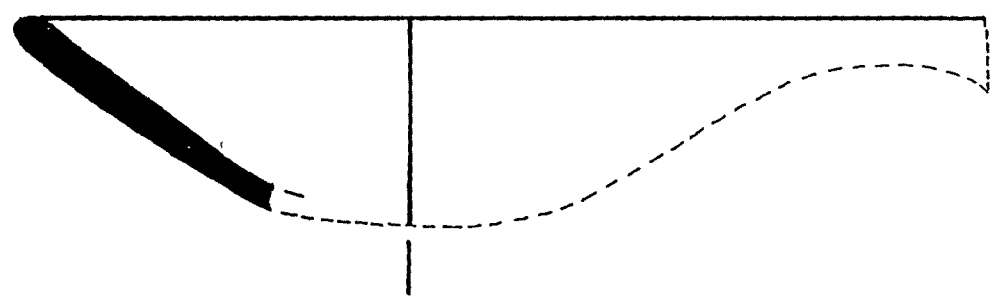

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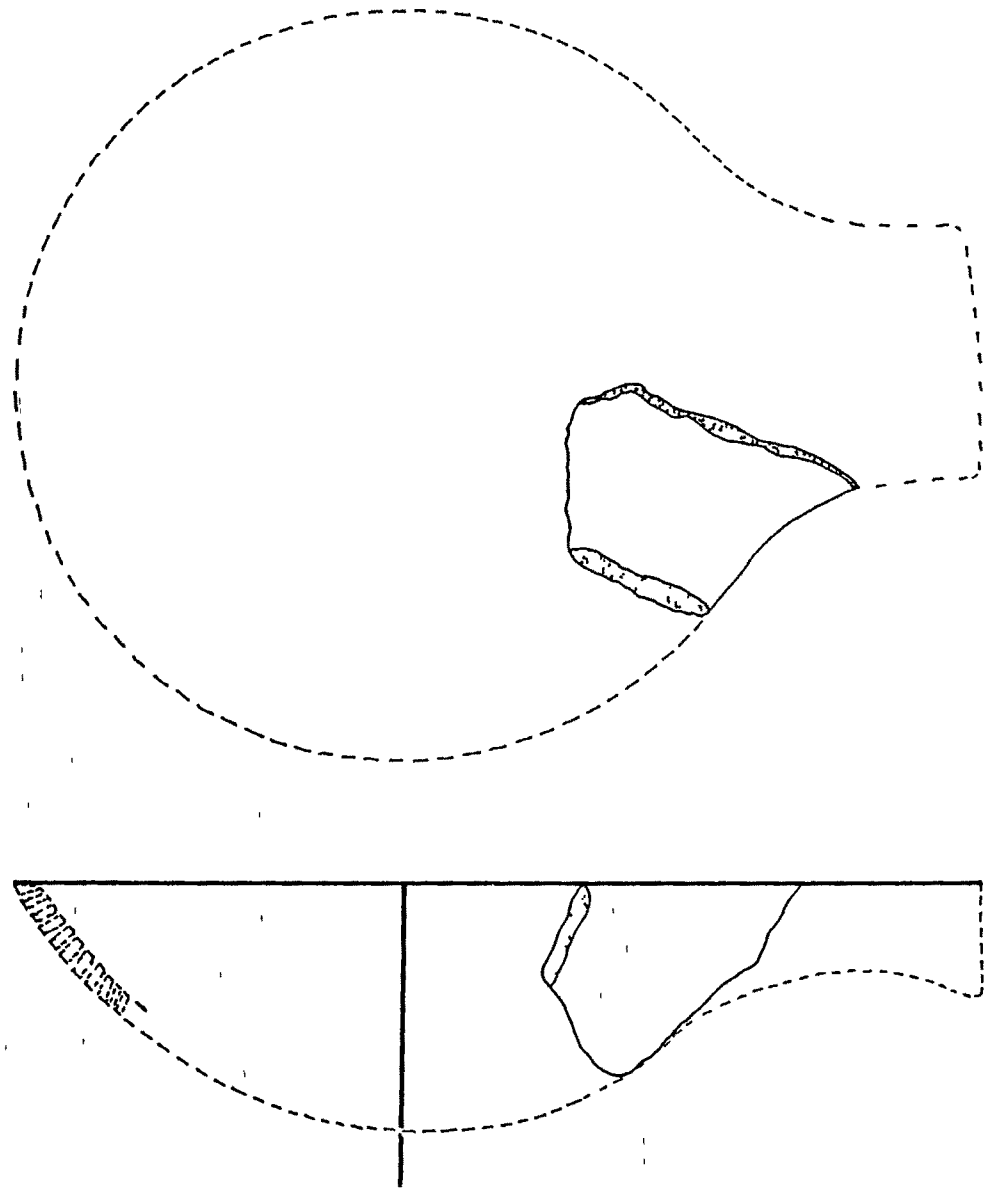

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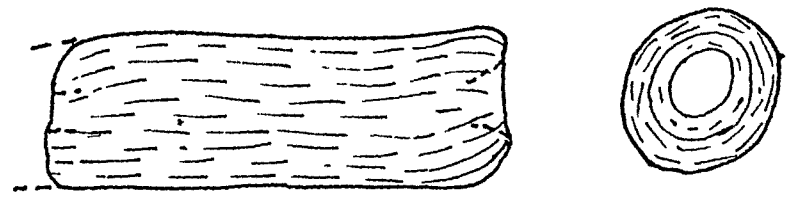

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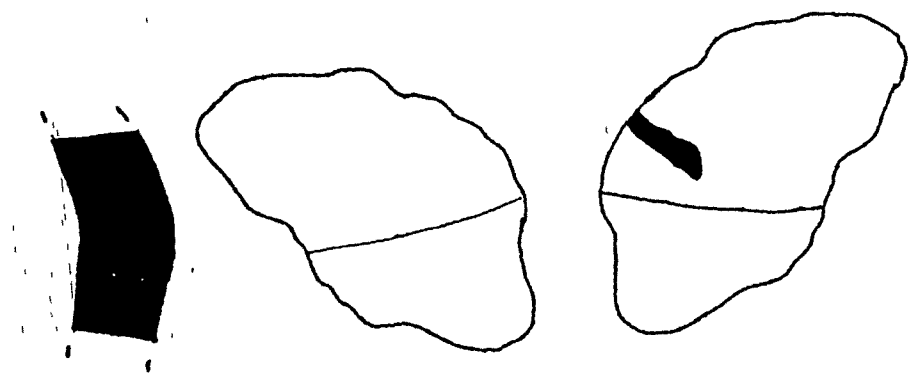

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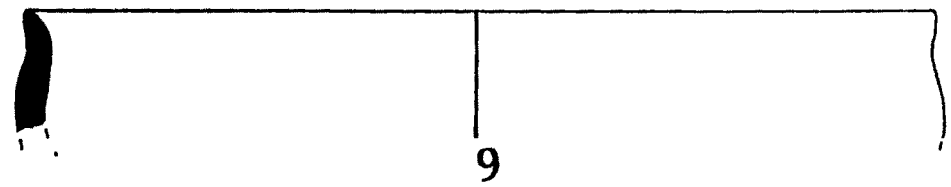
GREY WARE



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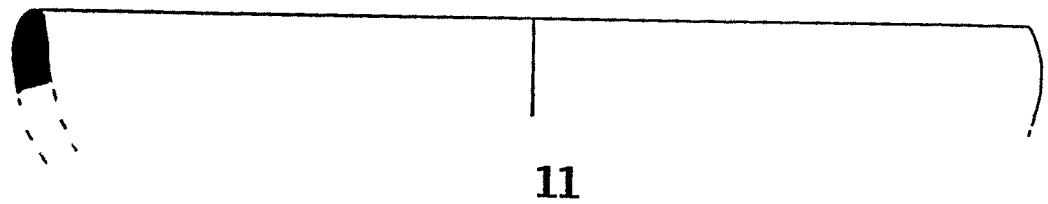

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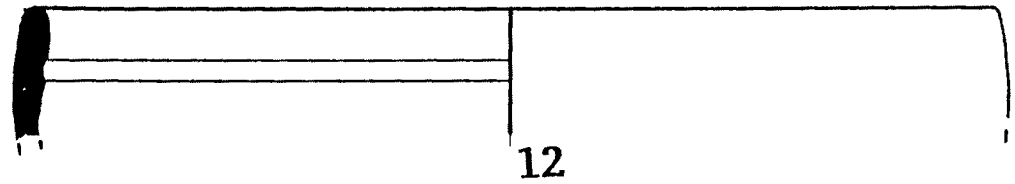

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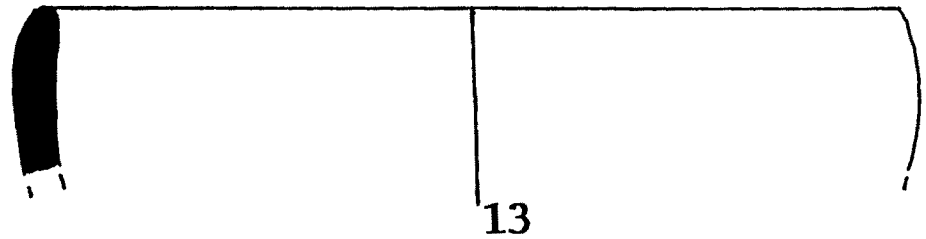

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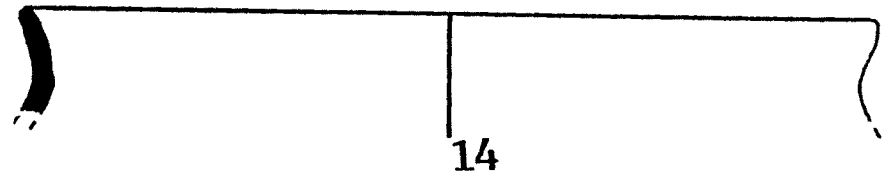

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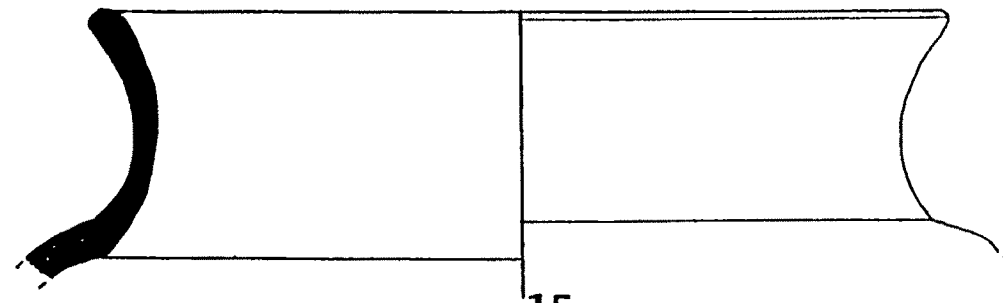
BROWN AND BLACK WARE



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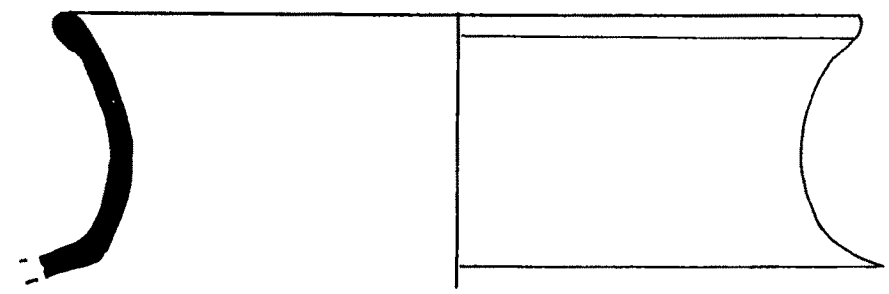

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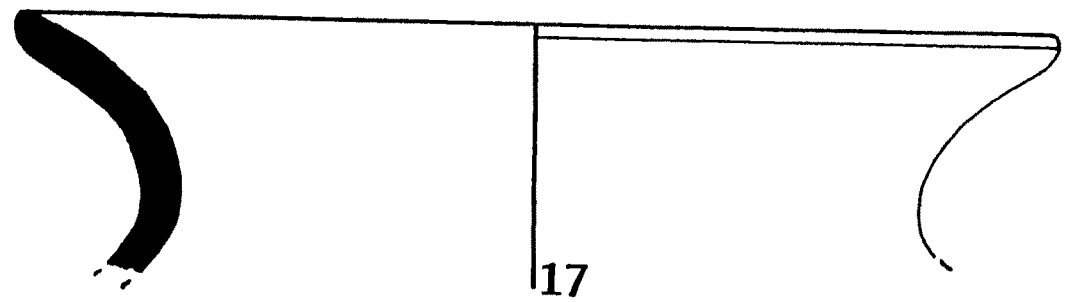

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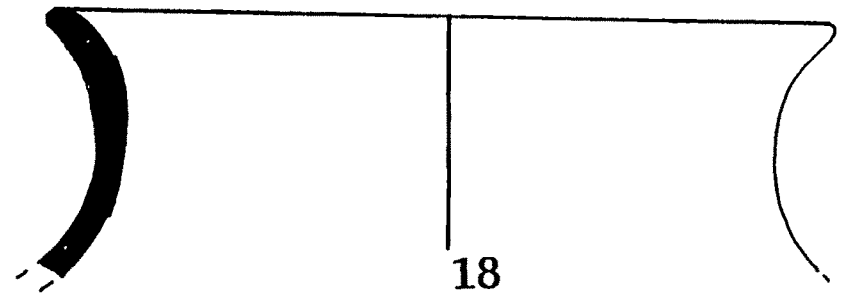

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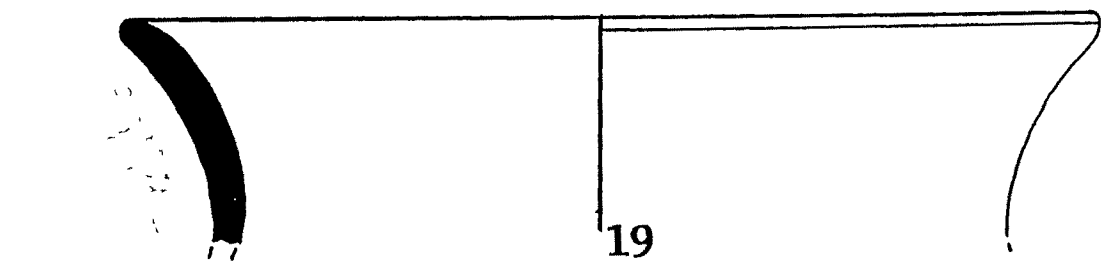
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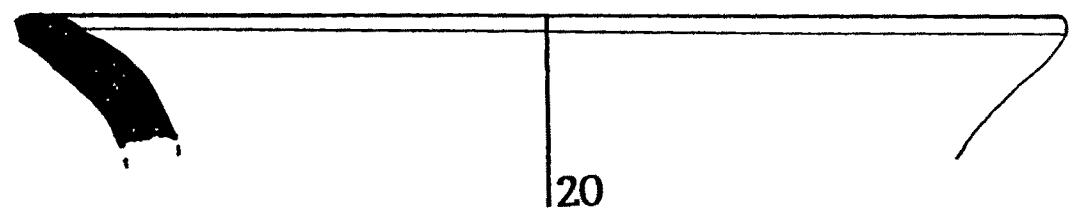
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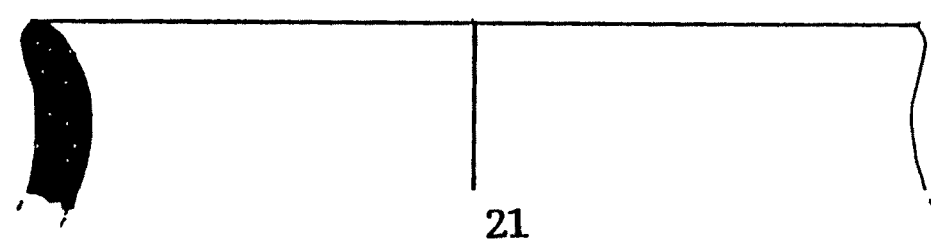
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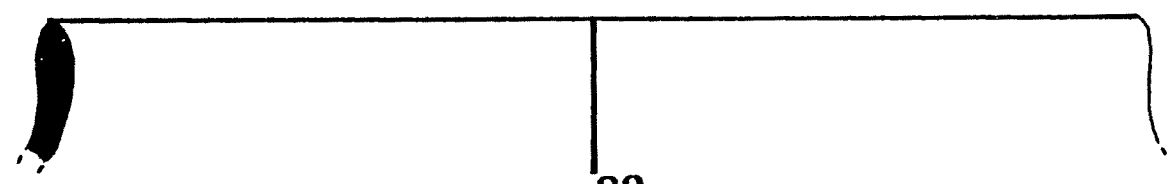
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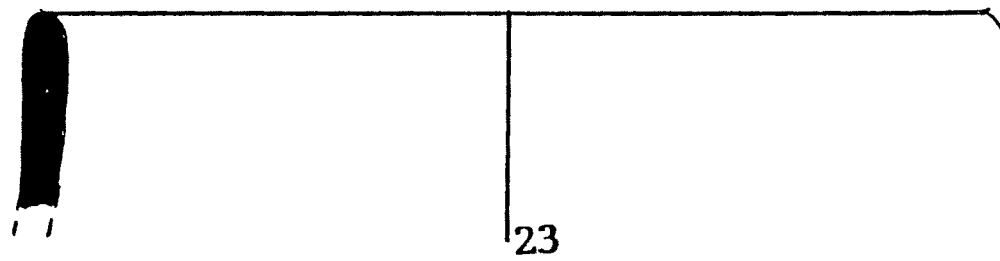
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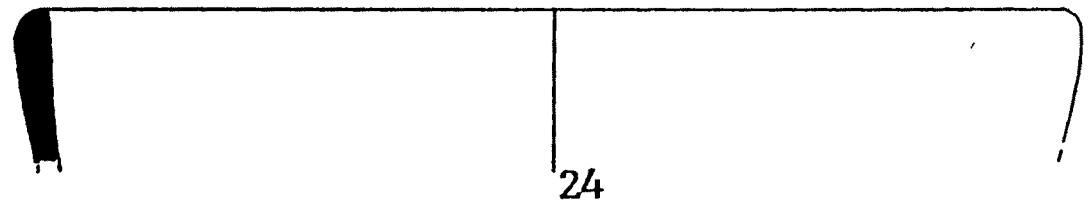
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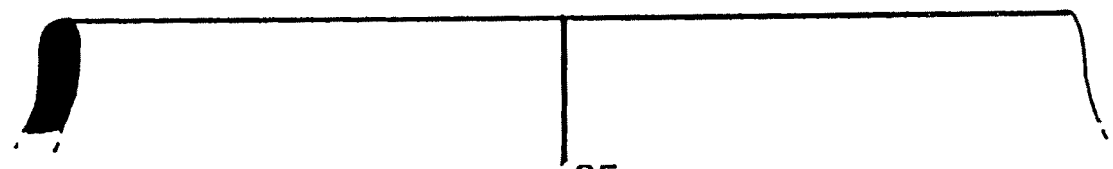

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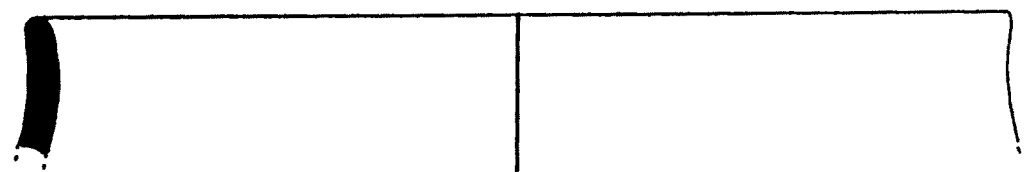

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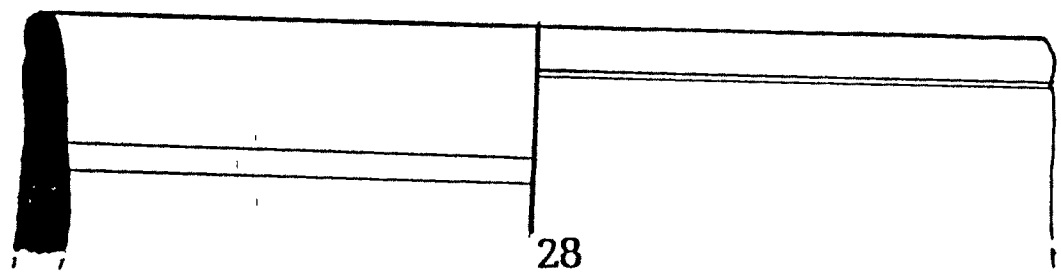

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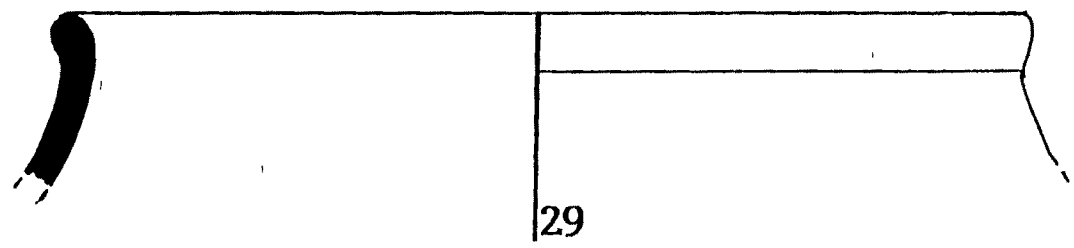

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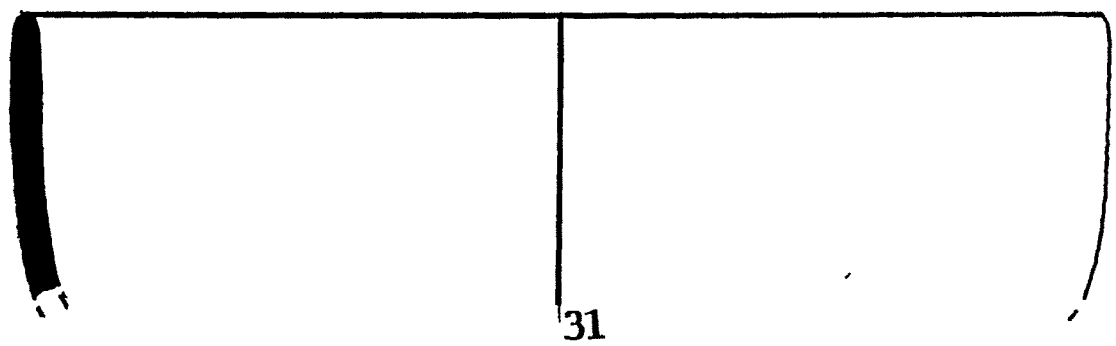
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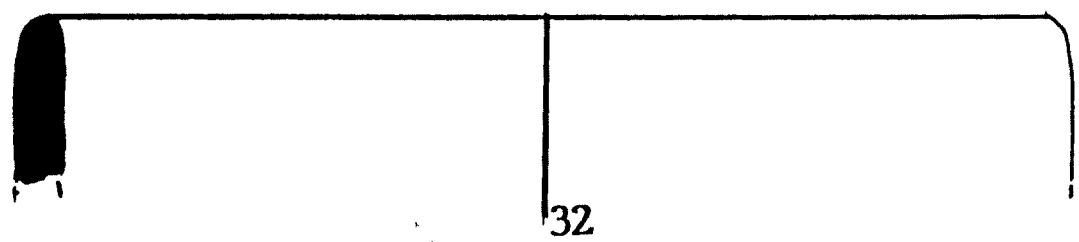
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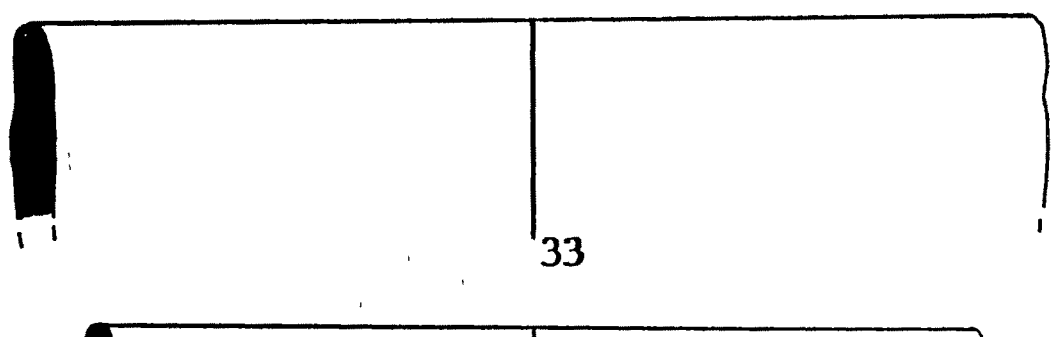
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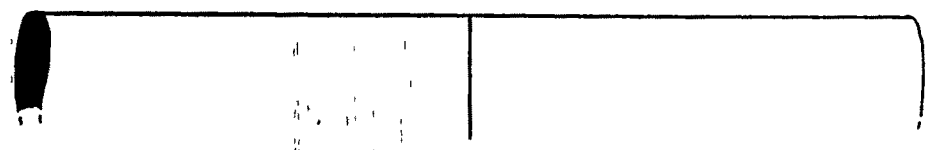
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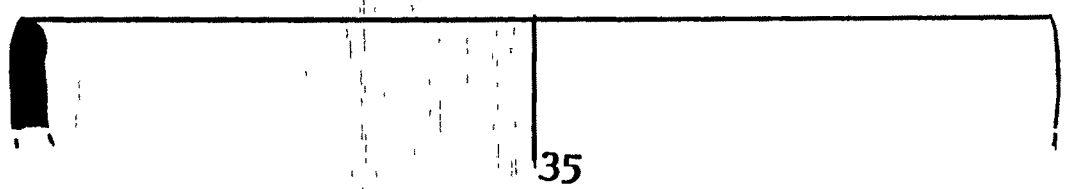
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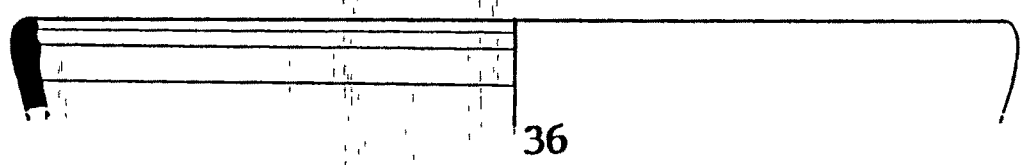
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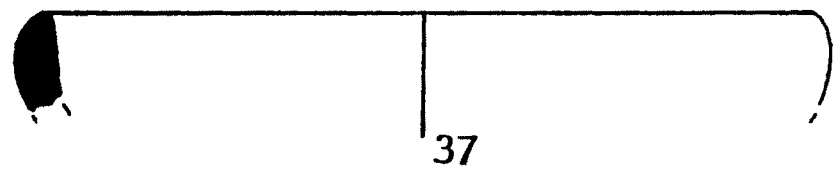

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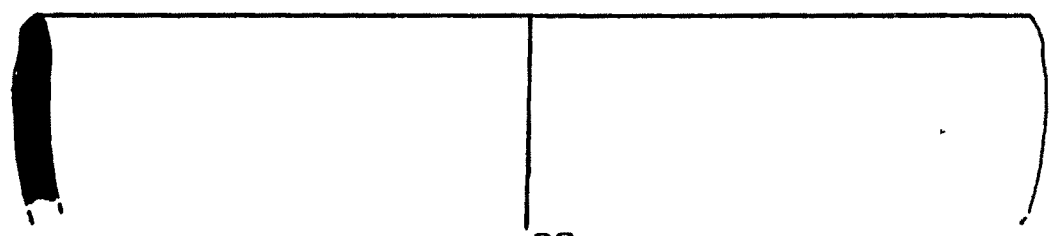

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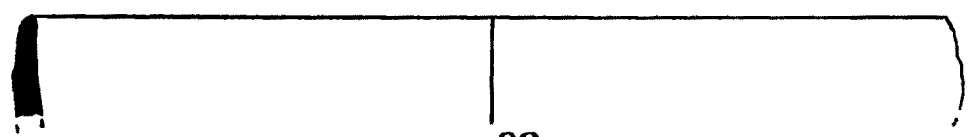

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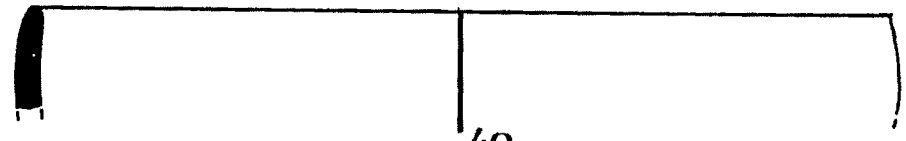

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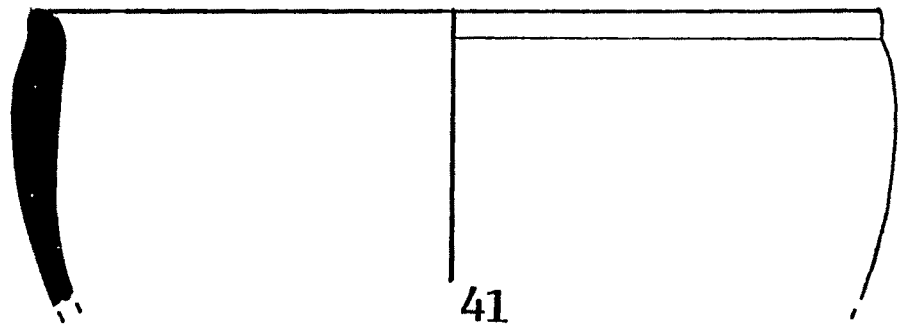

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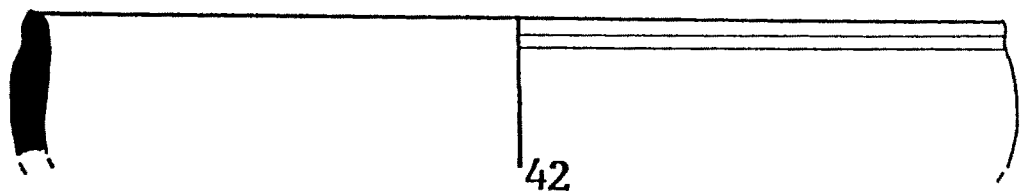

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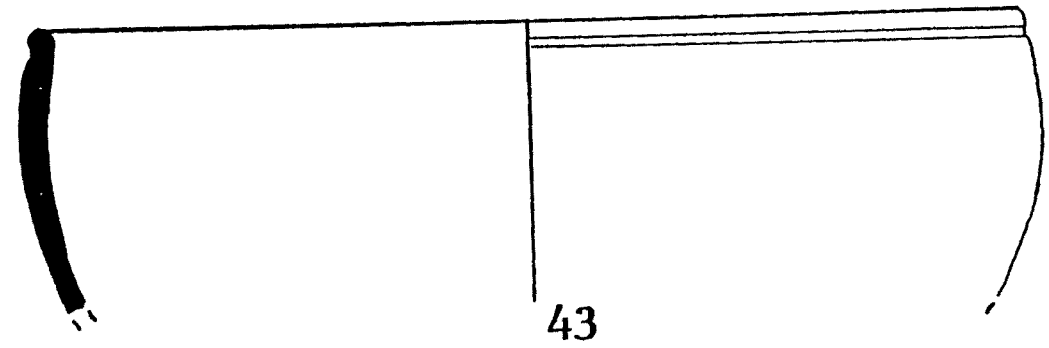

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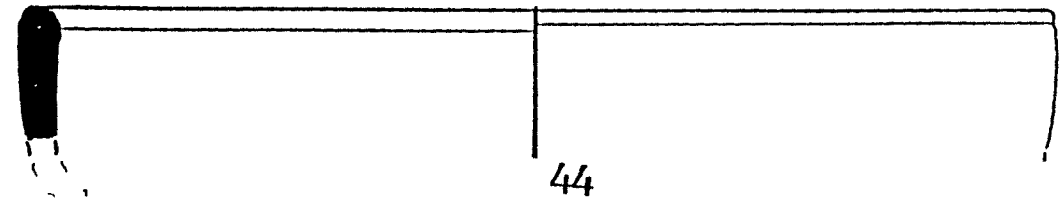

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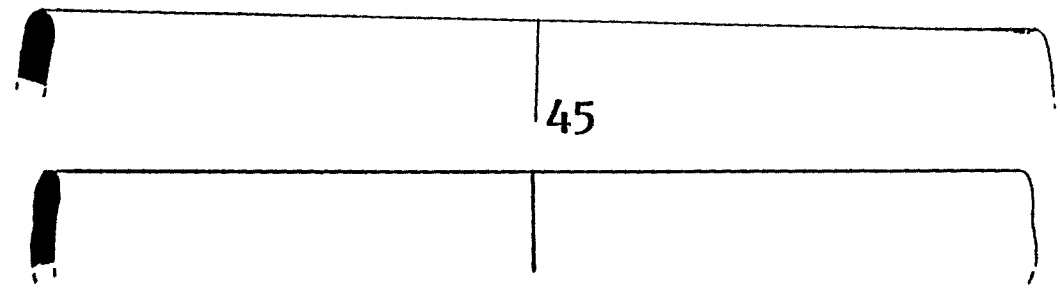

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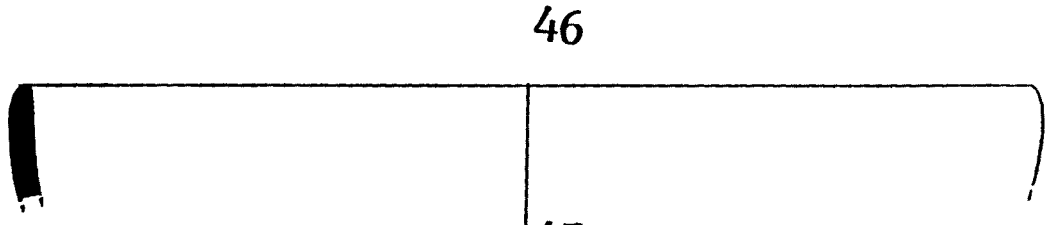

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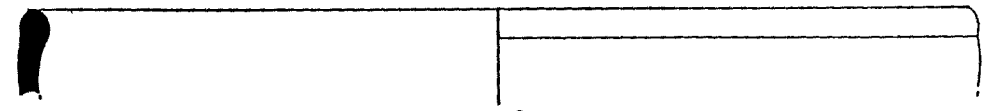

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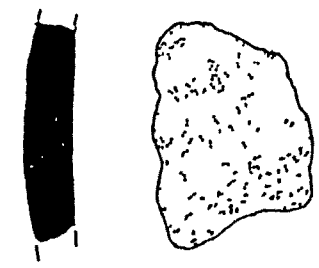

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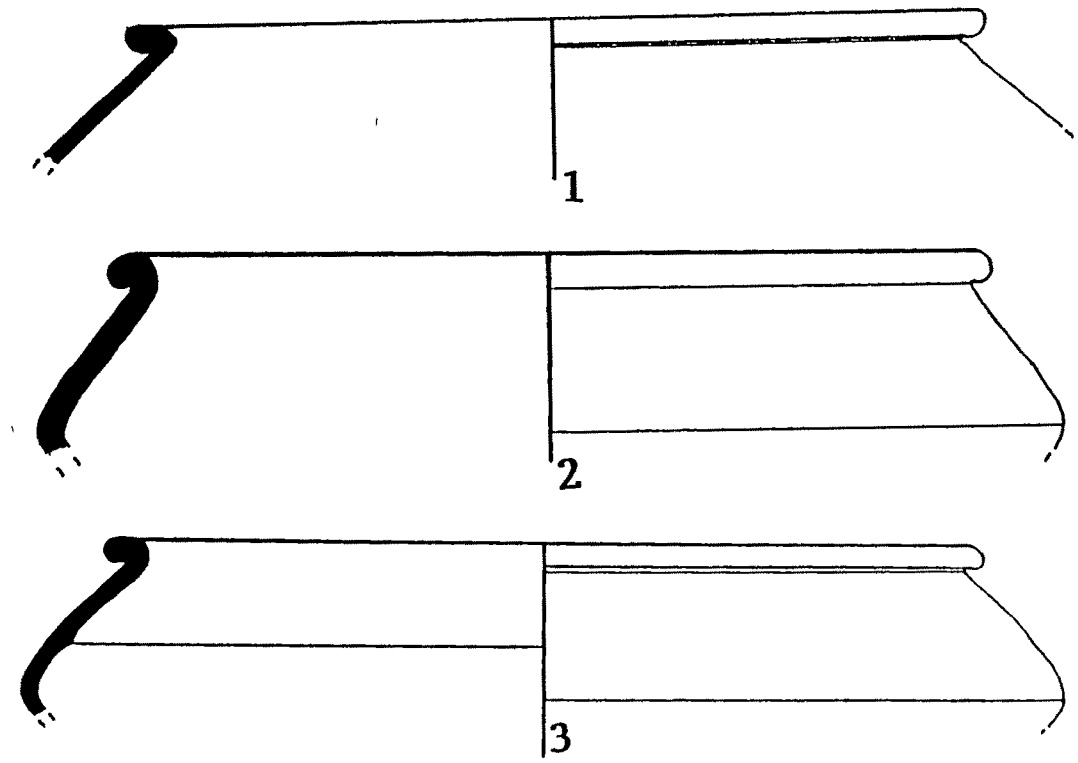
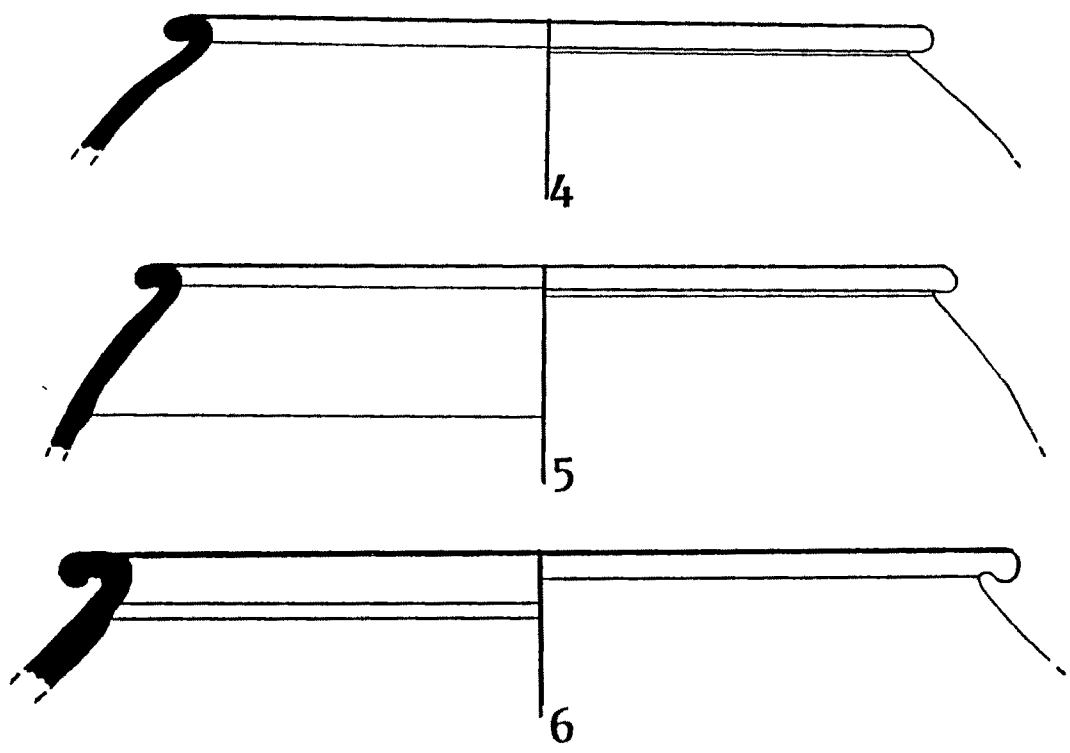
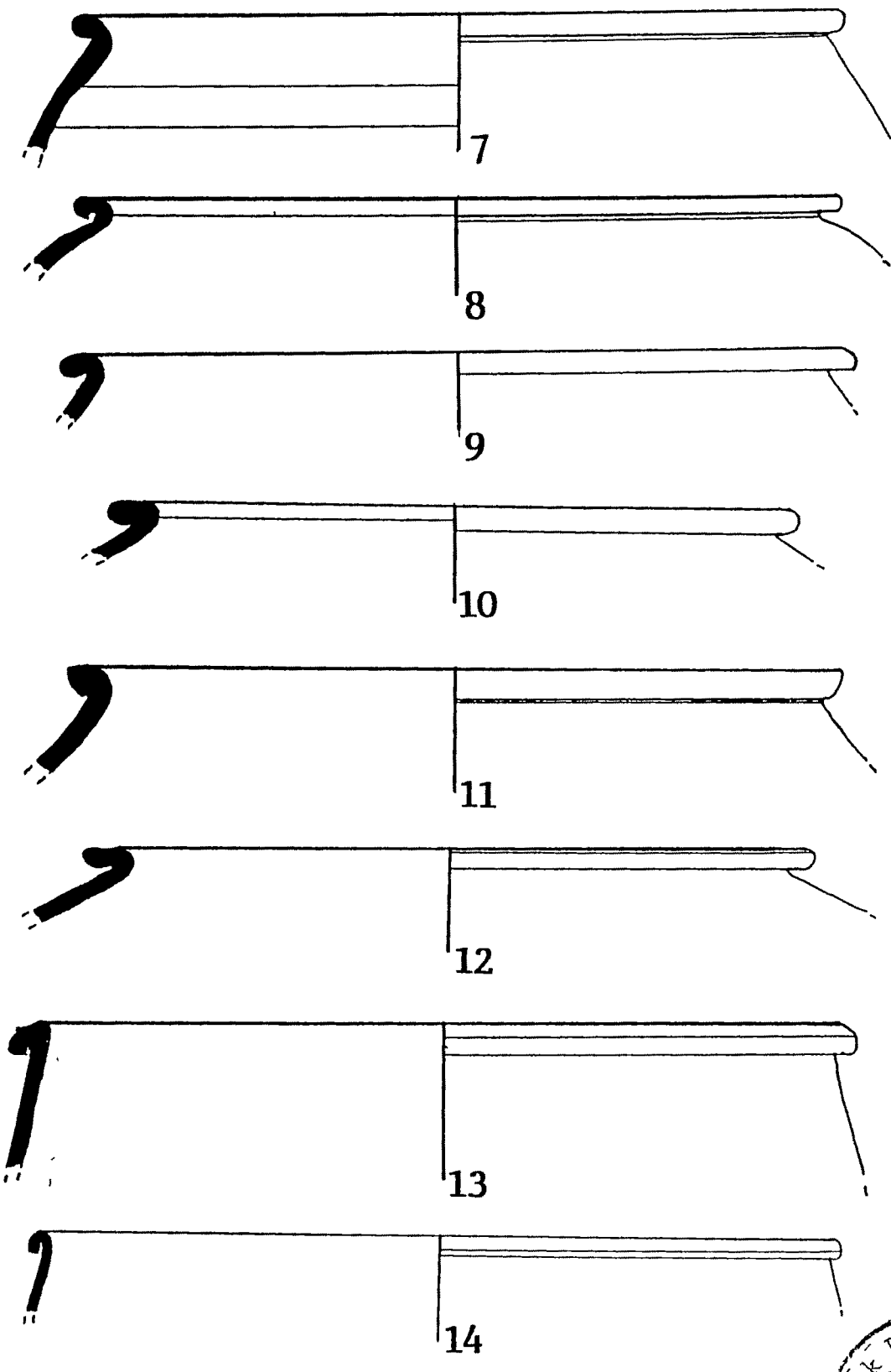
CHALCOLITHIC POTTERY

WHITE PAINTED BLACK AND RED WARE







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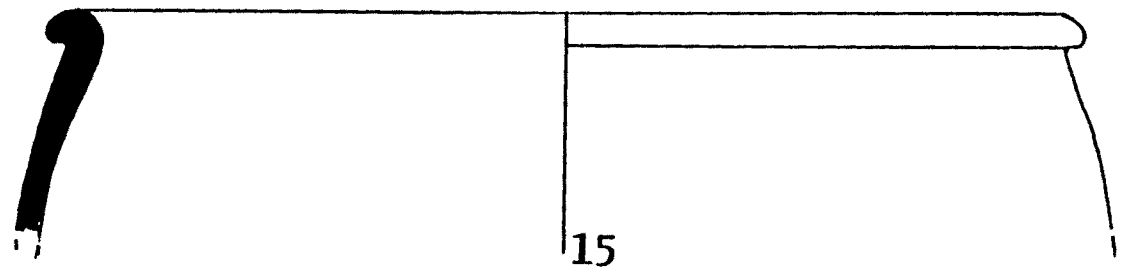
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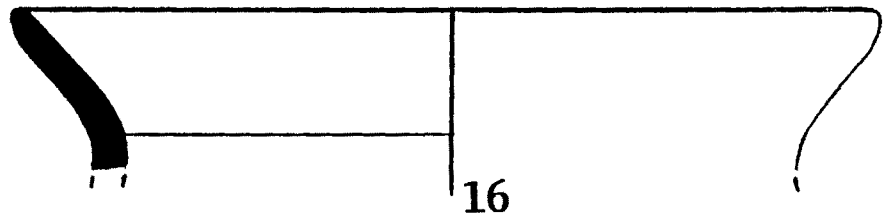
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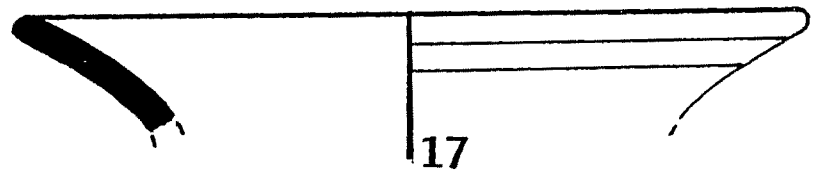
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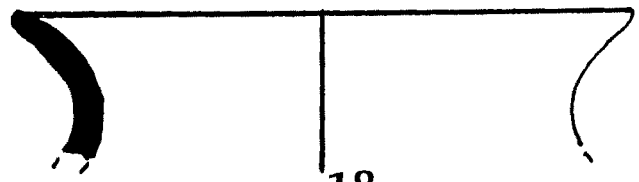
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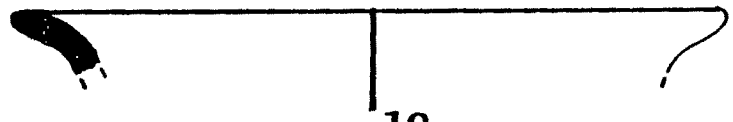
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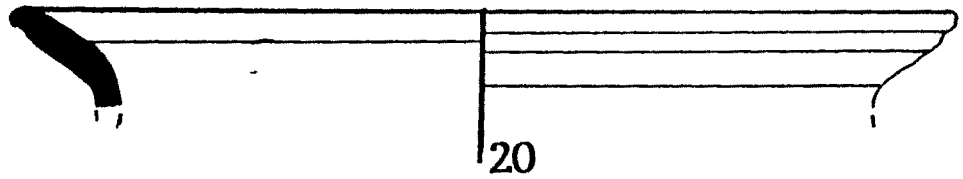
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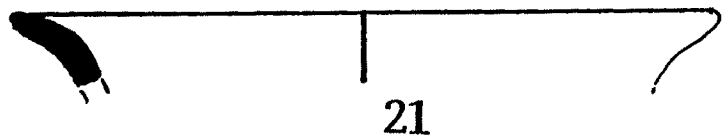
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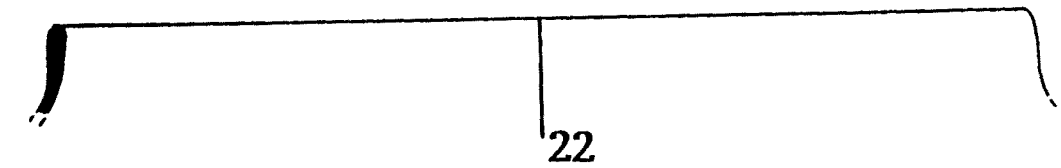
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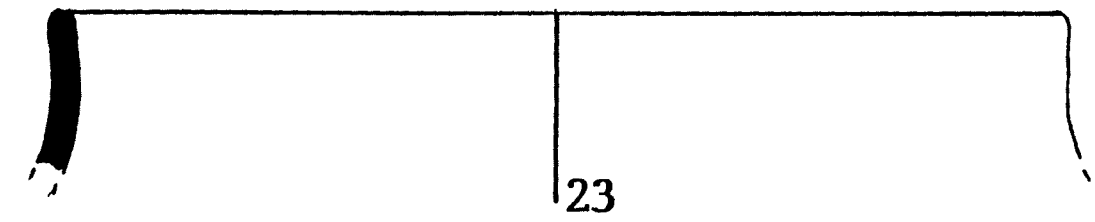
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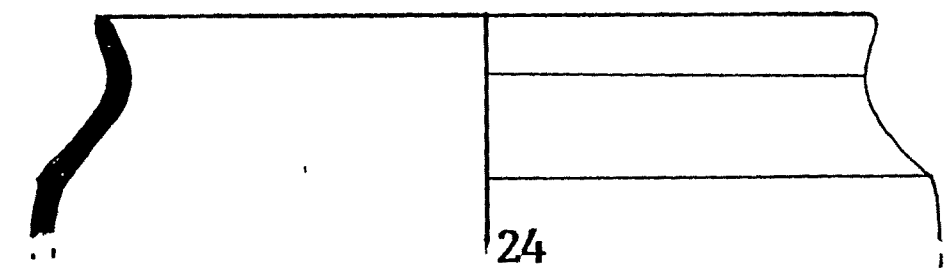
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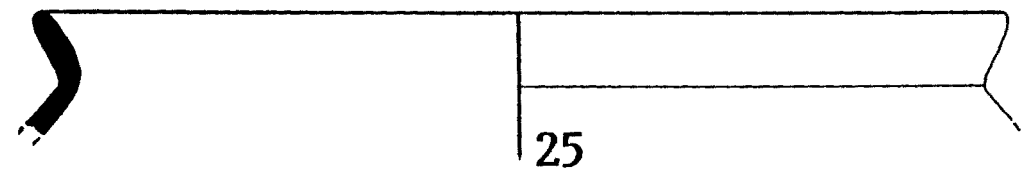
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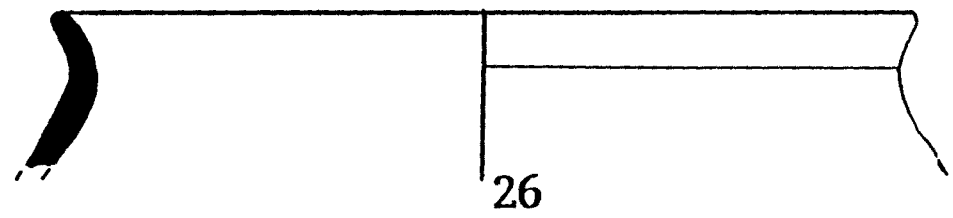
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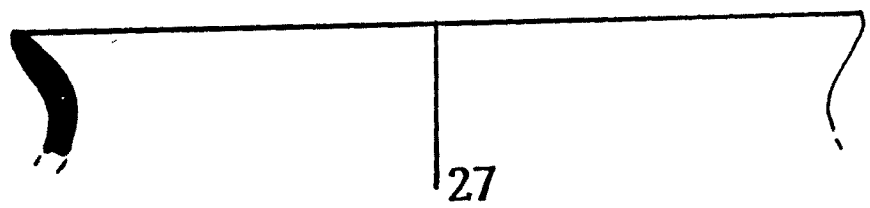
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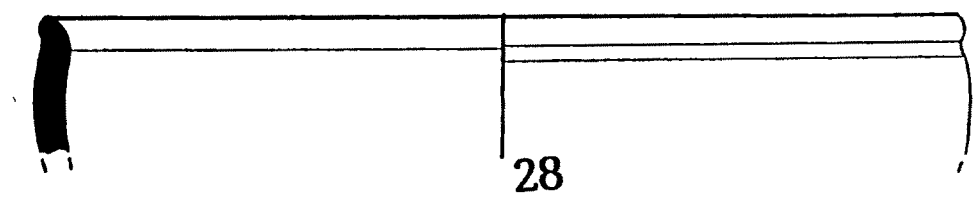

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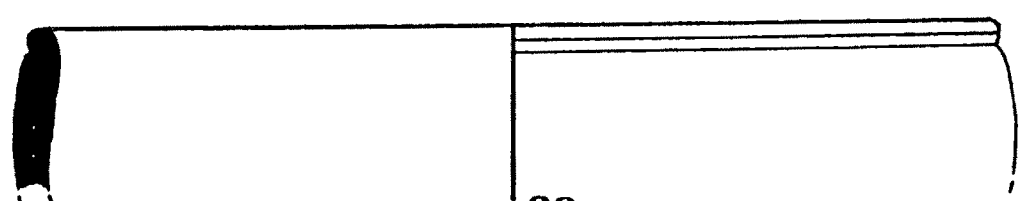

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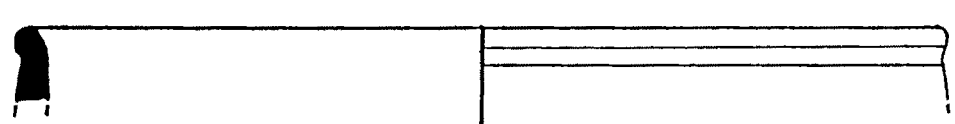

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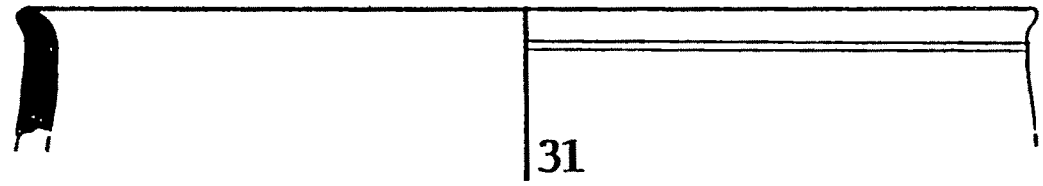

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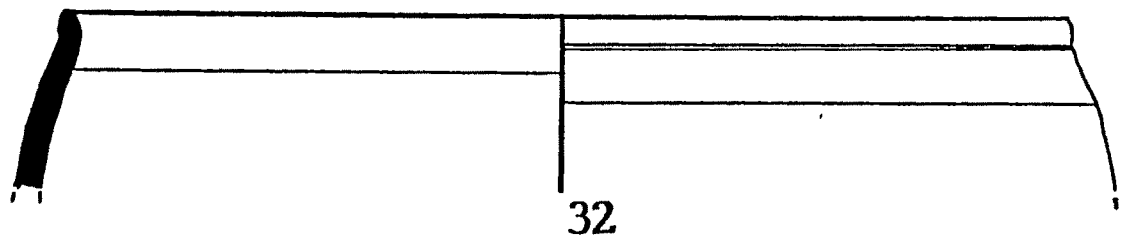

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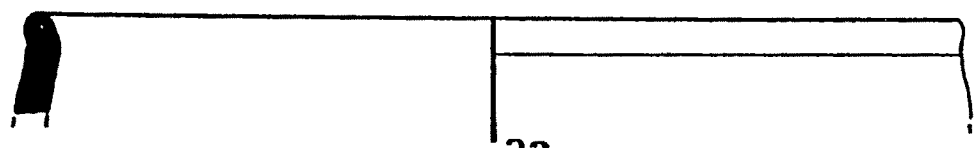

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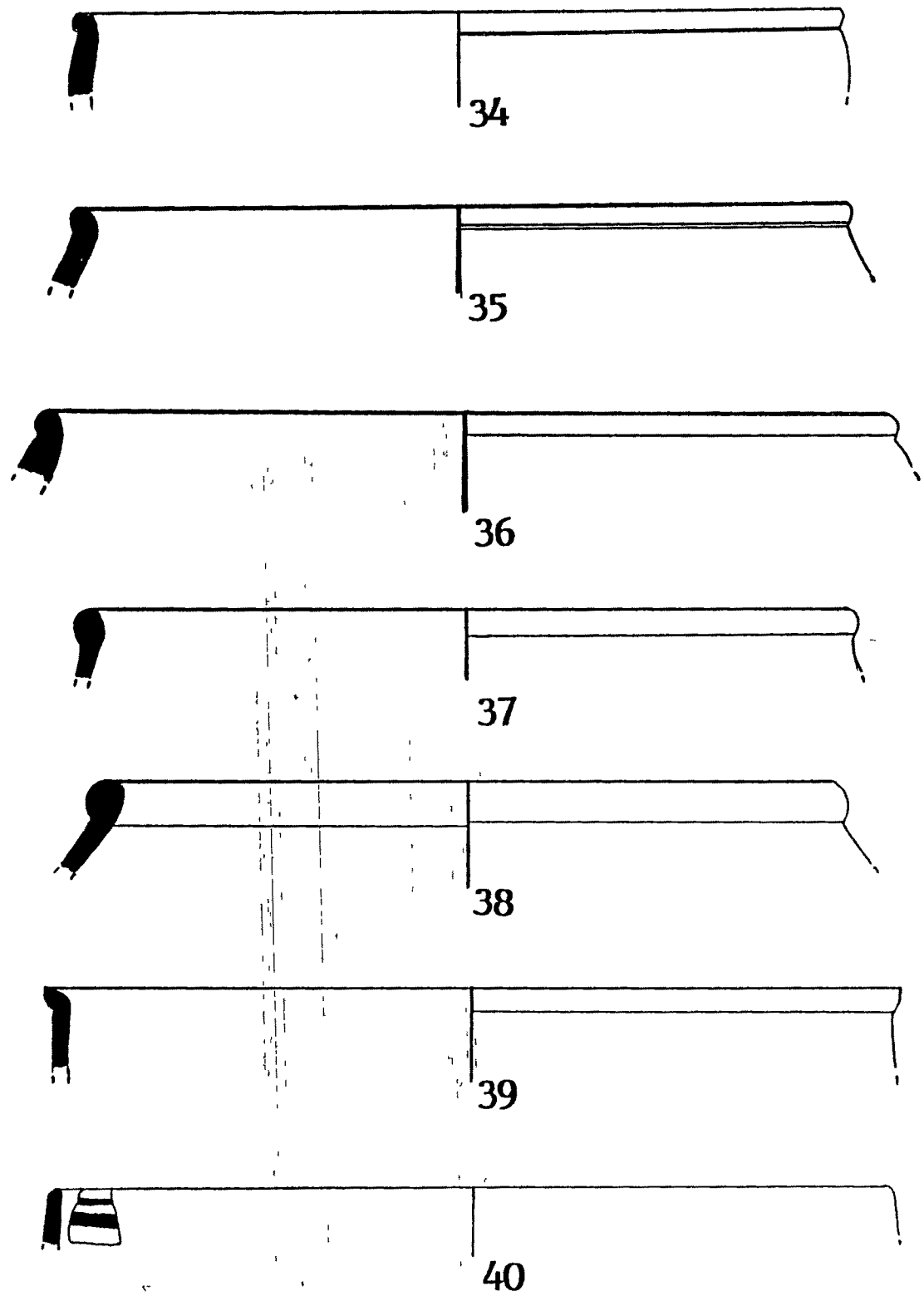
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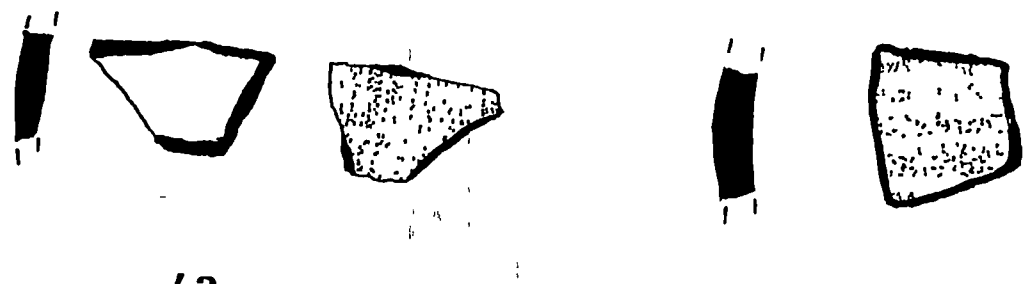

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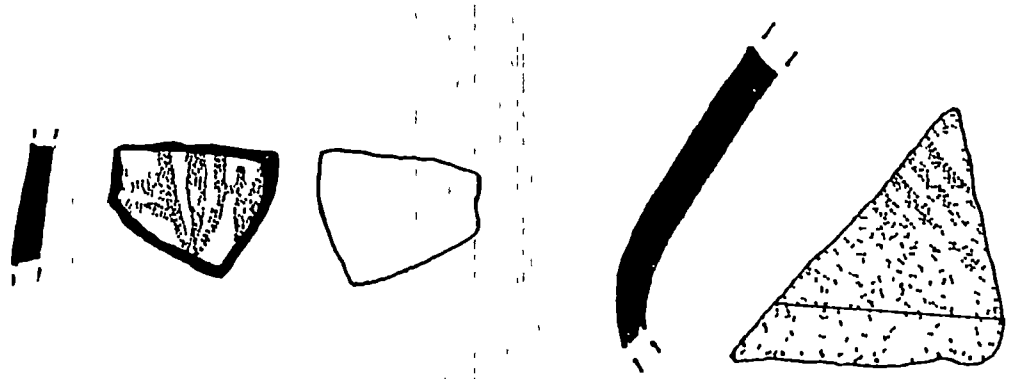

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Karnatak University Library
DHARWAD

POTTERY (Surface collection)

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Scale

I. Neolithic:

Sl.Nos.,10,12,39,40,41 & 44 are drawn to 1:2/5
Sl.Nos., 3,7,8,9,17,24,25 & 27 are drawn to .. .. 1·½
Sl.Nos., 1,2,4,6,15 & 37 are drawn to 1:3/5
Sl.No. 14 is drawn to 1:3/4
Sl.Nos., 11,18,28,36 & 38 are drawn to 1.4/5
Sl.Nos., 26,34,35 & 45 are drawn to 1:2/3
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II. Chalcolithic:

Sl.Nos., 1,11 & 24 are drawn to 1:½
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Sl.Nos., 7,9,10,13,20,21 & 22 are drawn to 1:3/5

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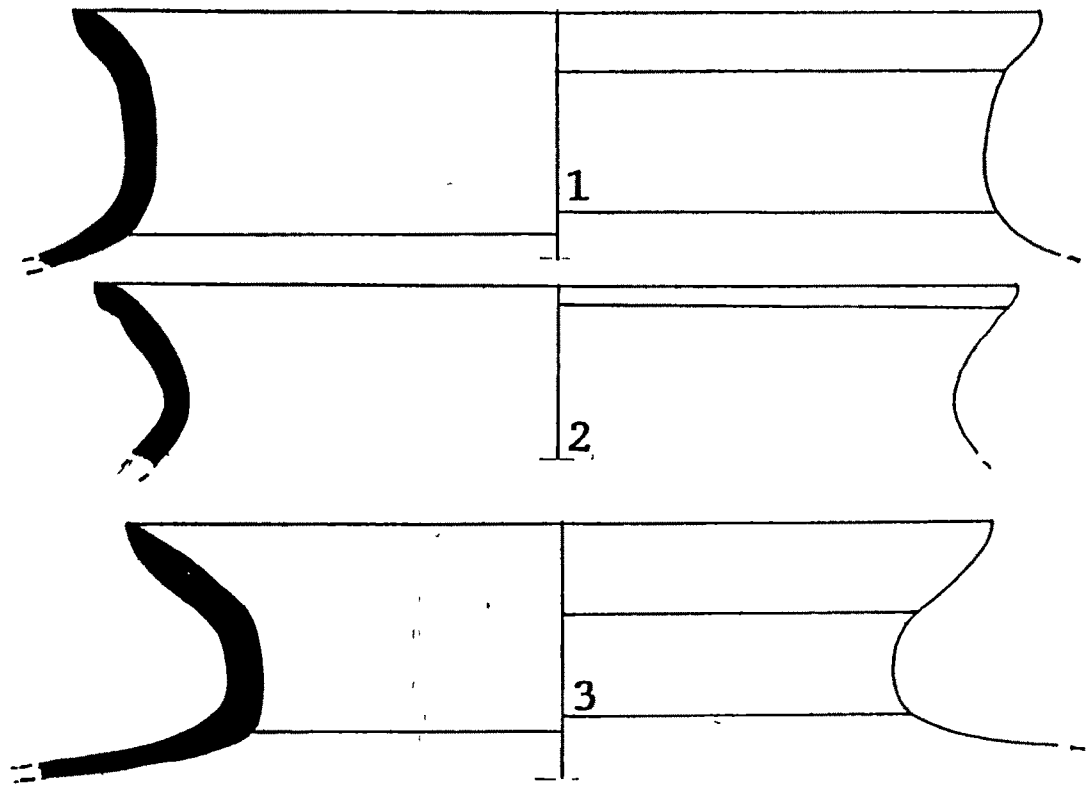
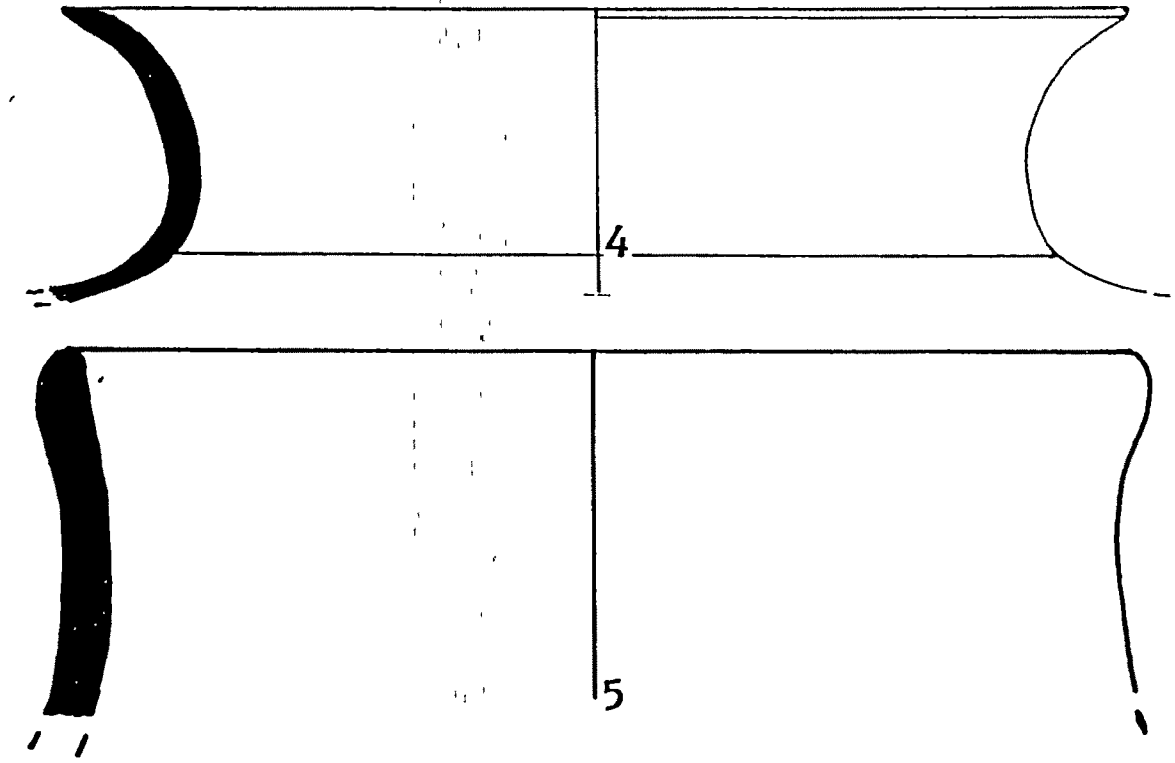
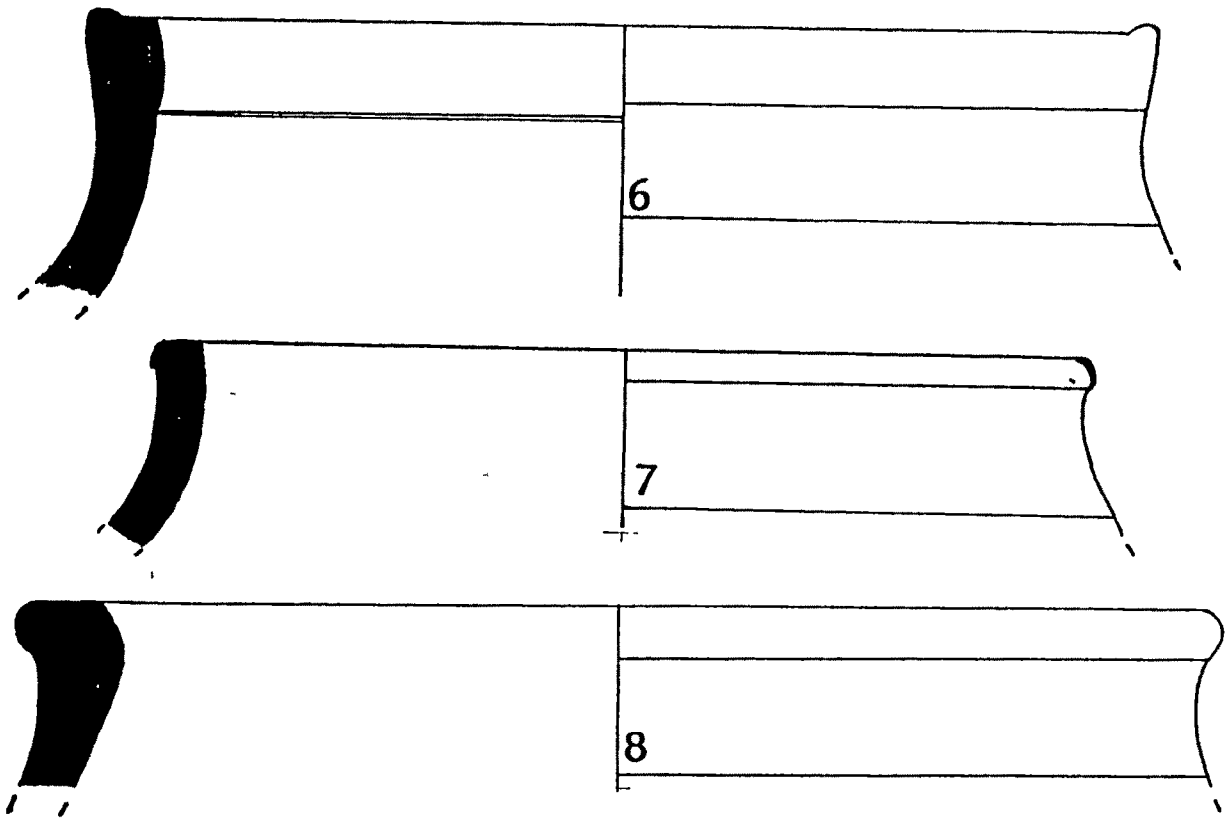
Neolithic pottery

BROWN AND BLACK WARE



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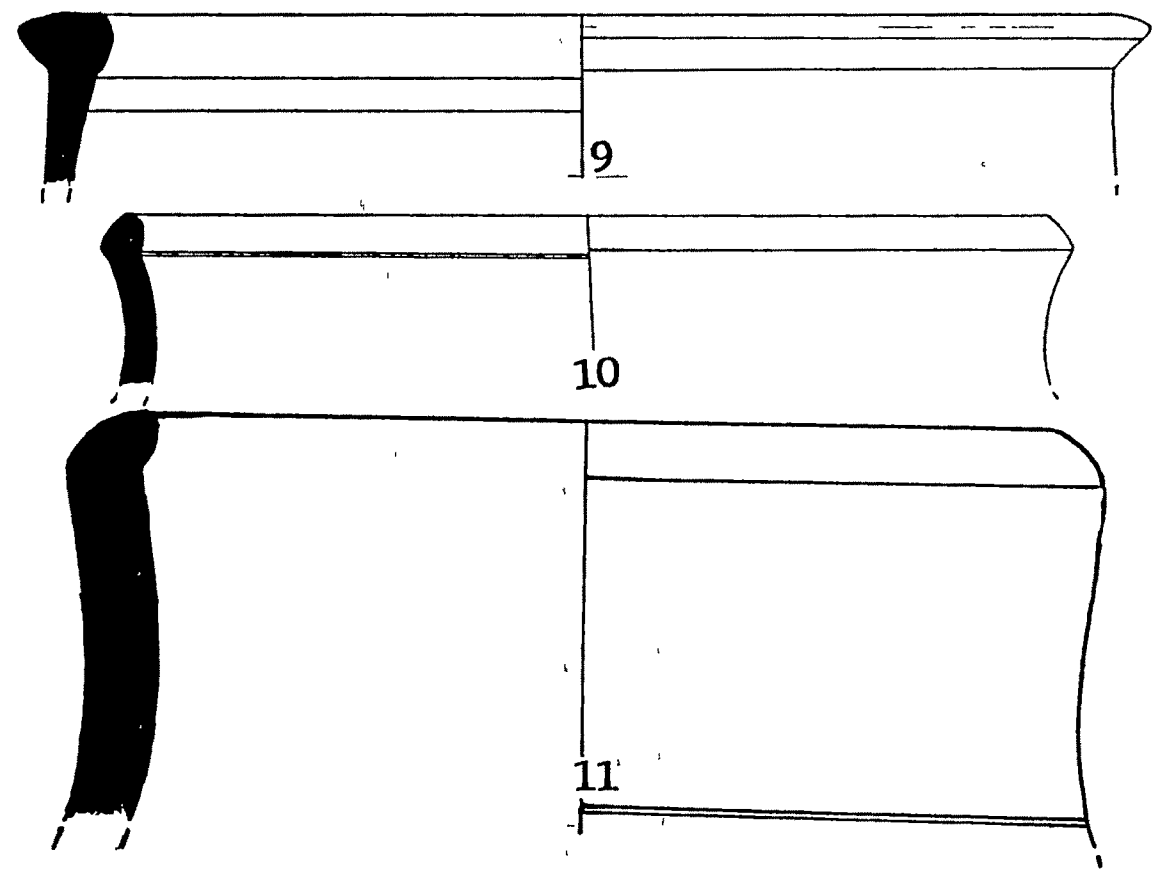
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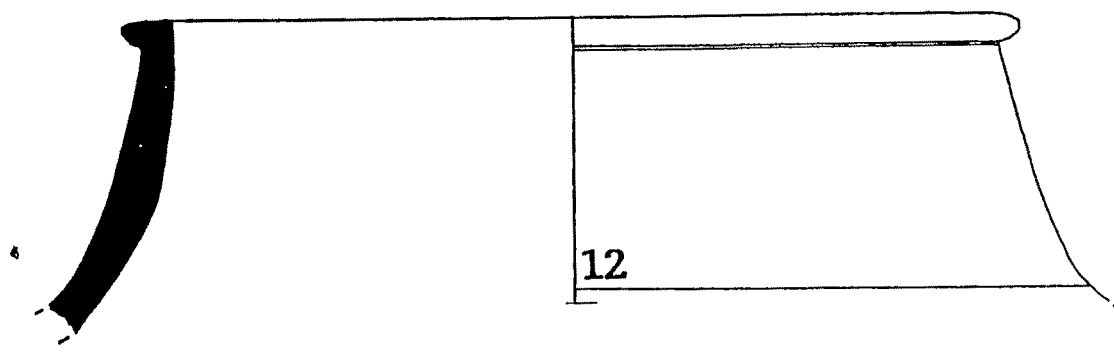
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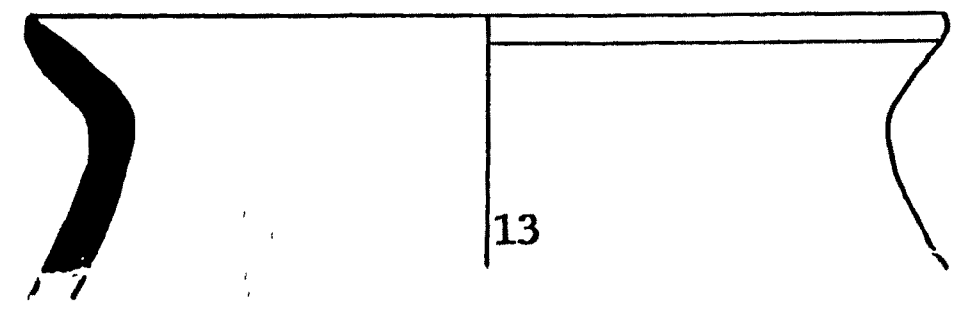
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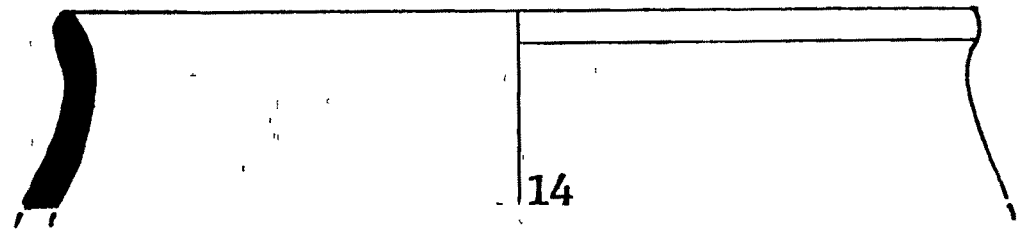
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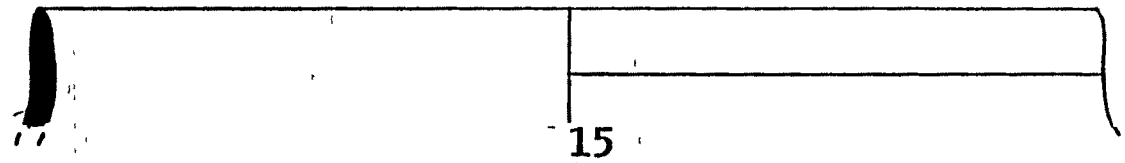
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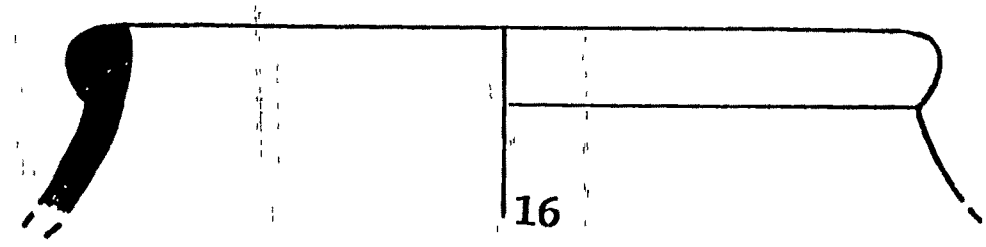
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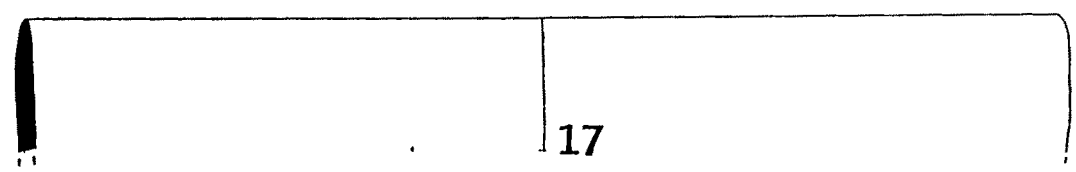
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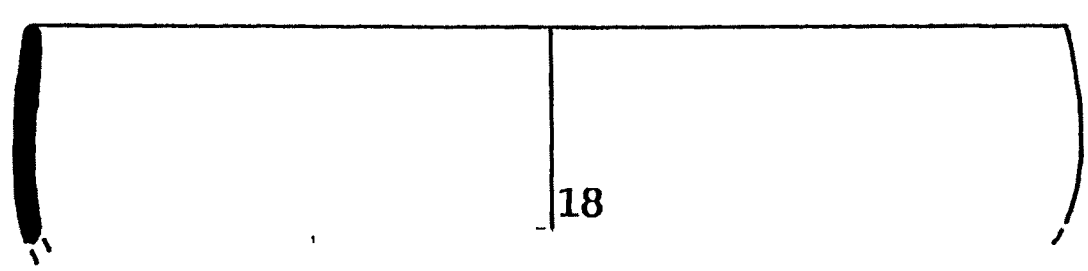
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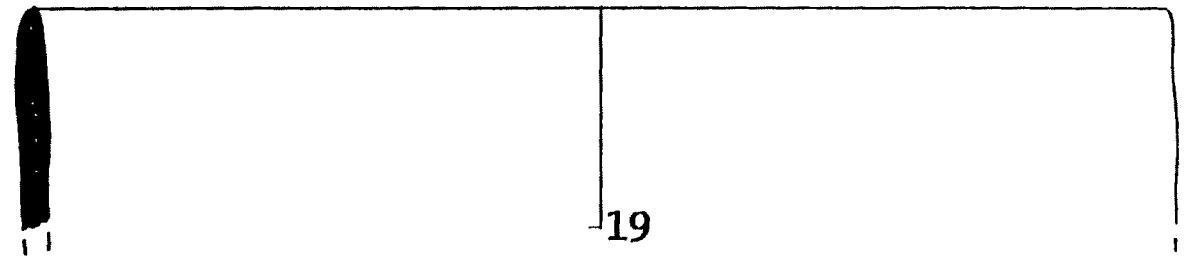
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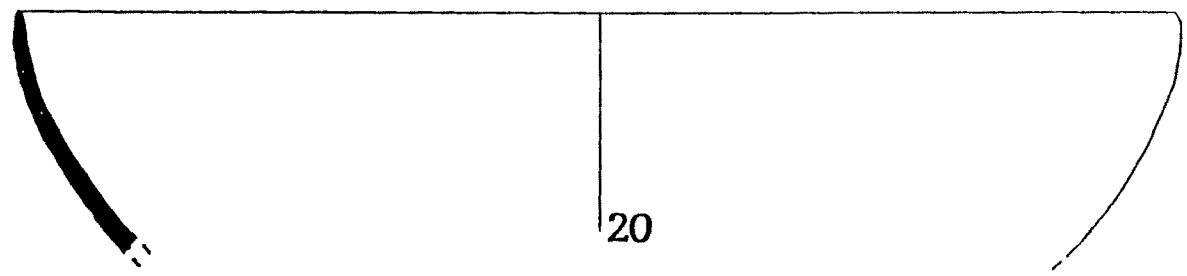
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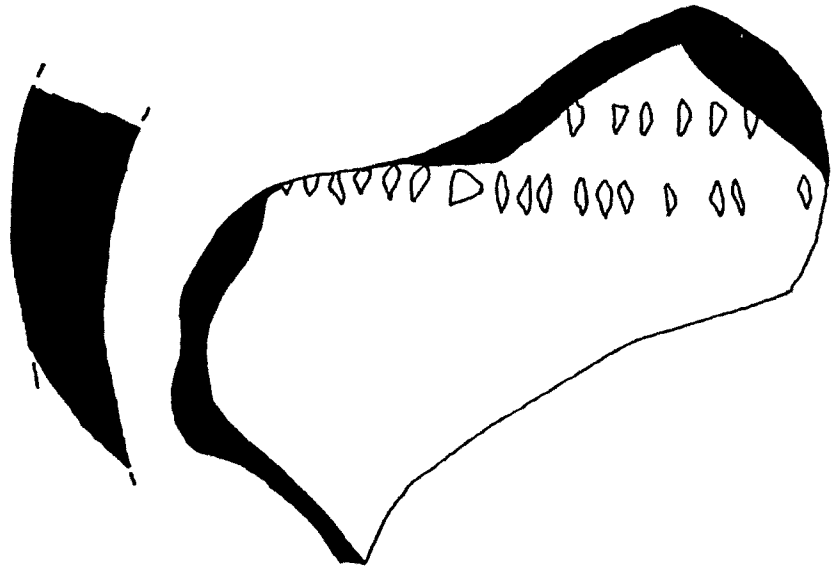

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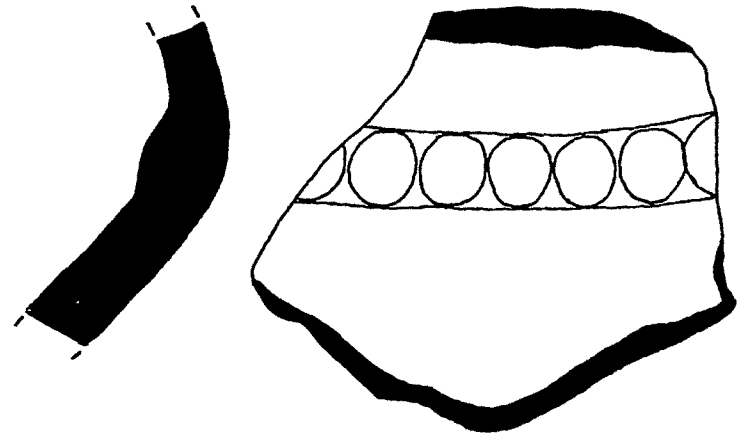

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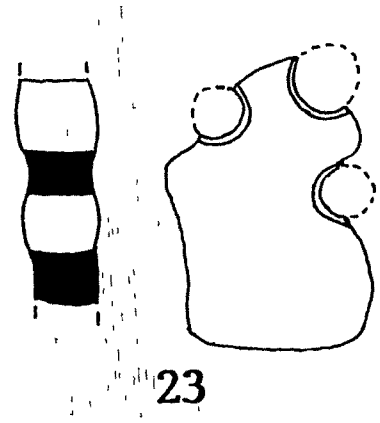

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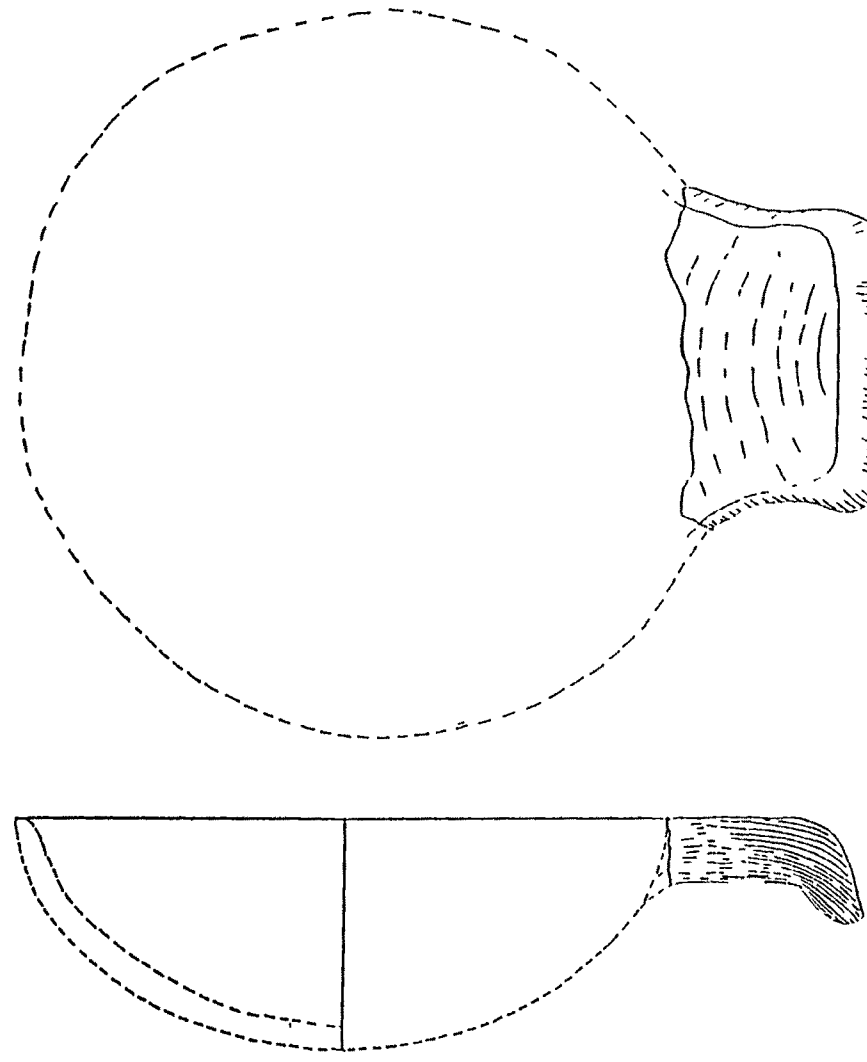

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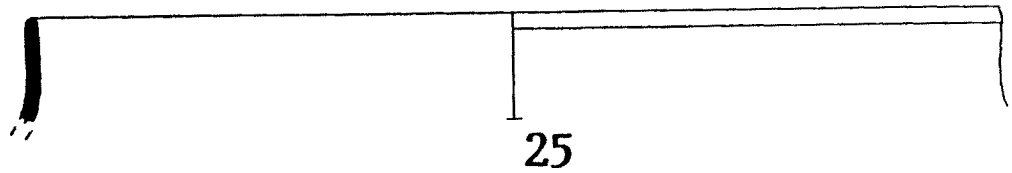
GREY WARE



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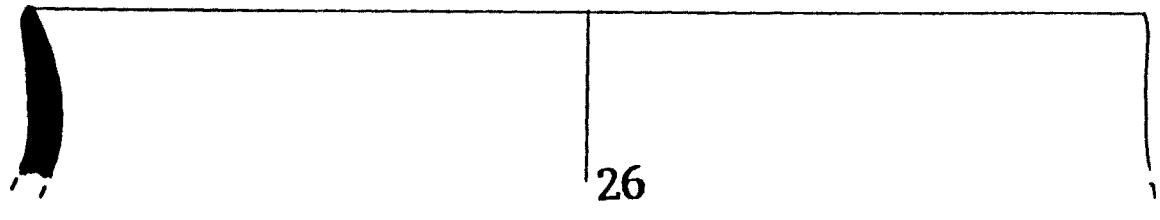

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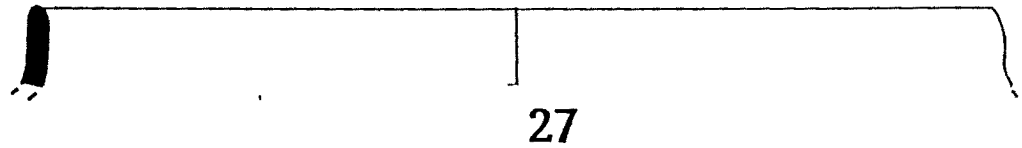

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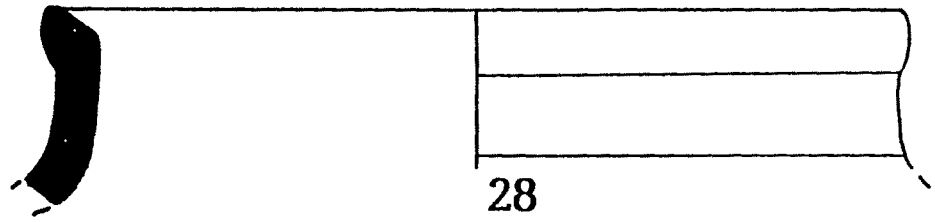

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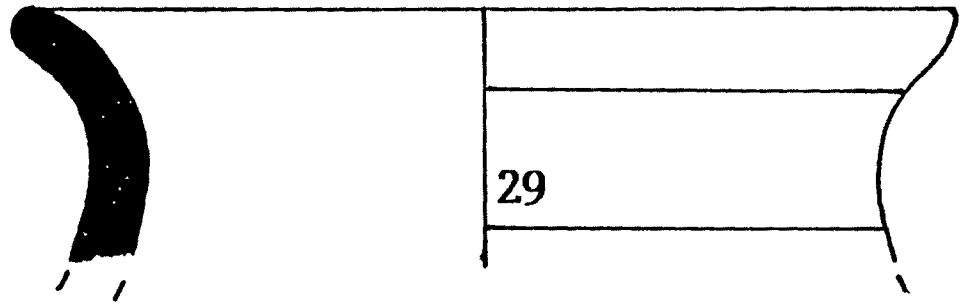

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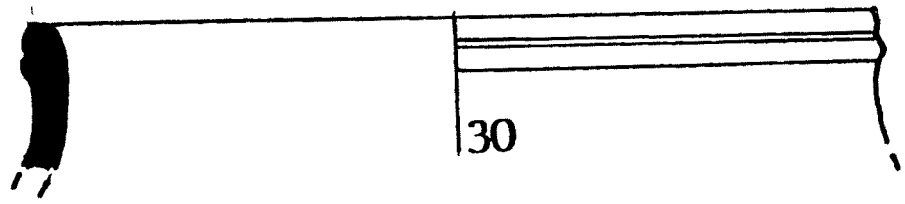

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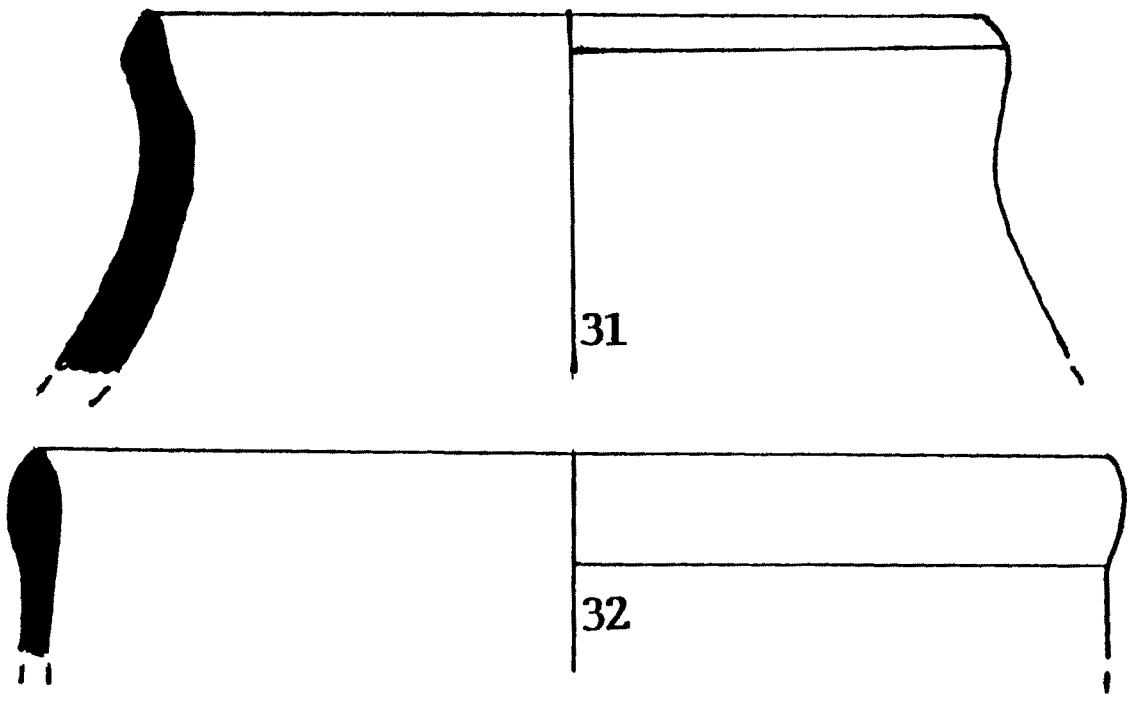

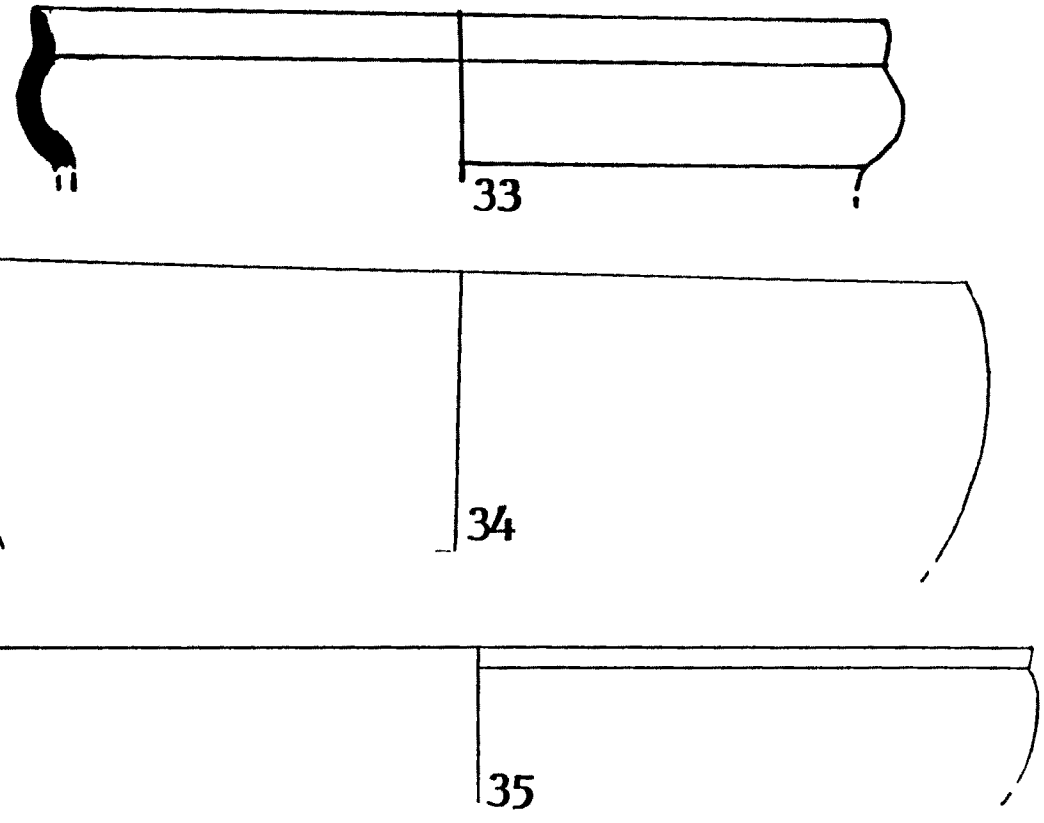

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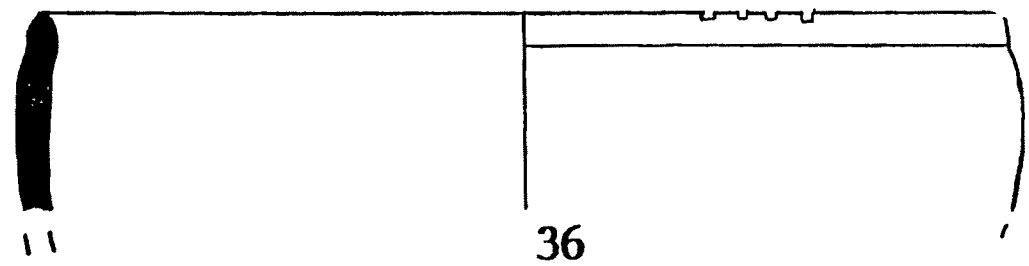

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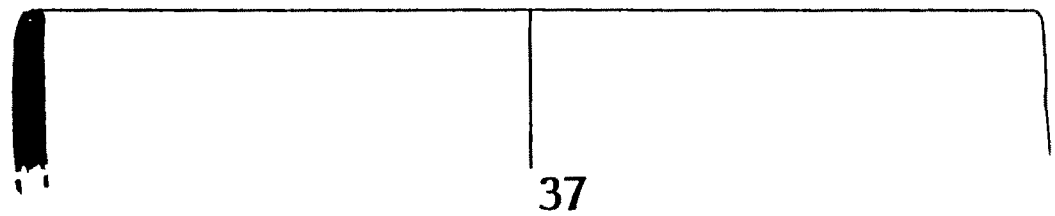

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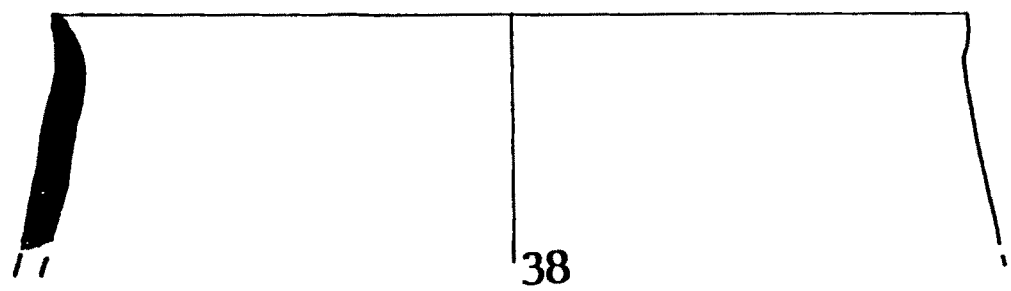

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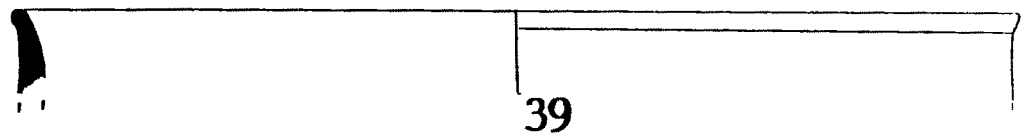

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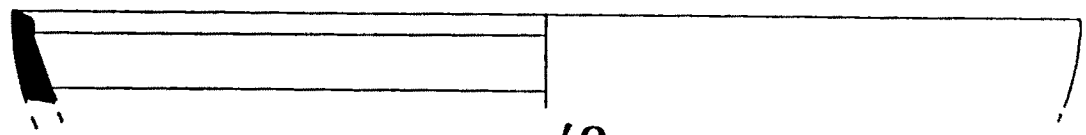

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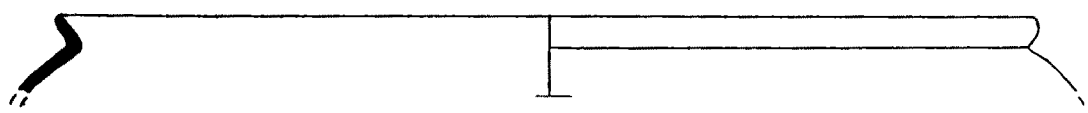

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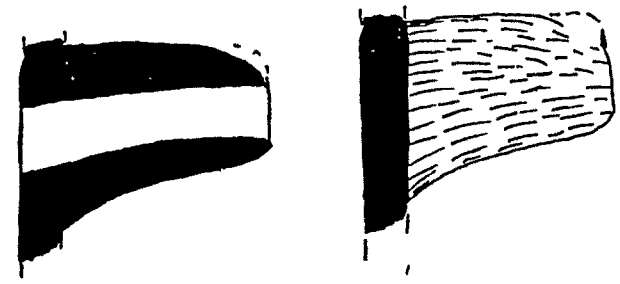

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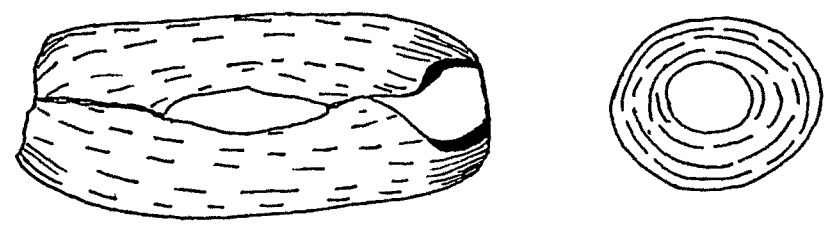

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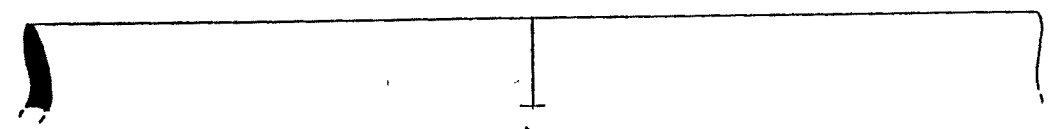

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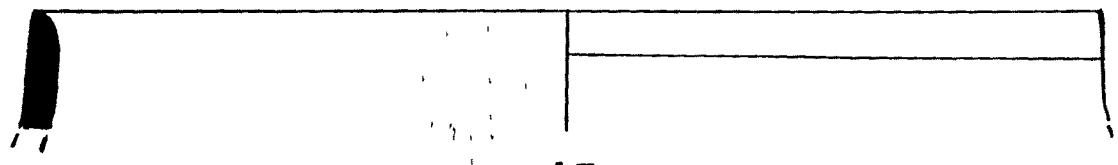

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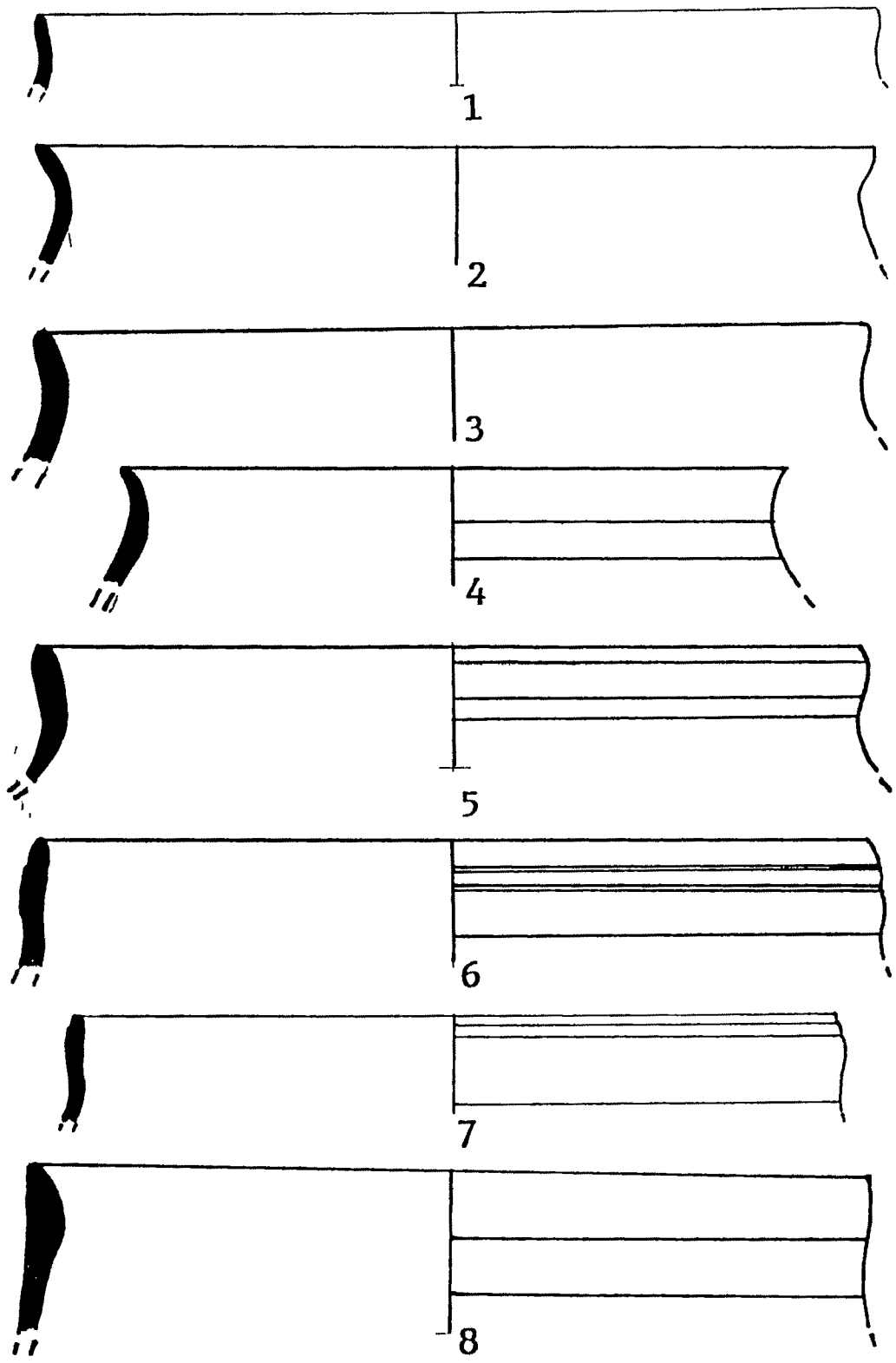
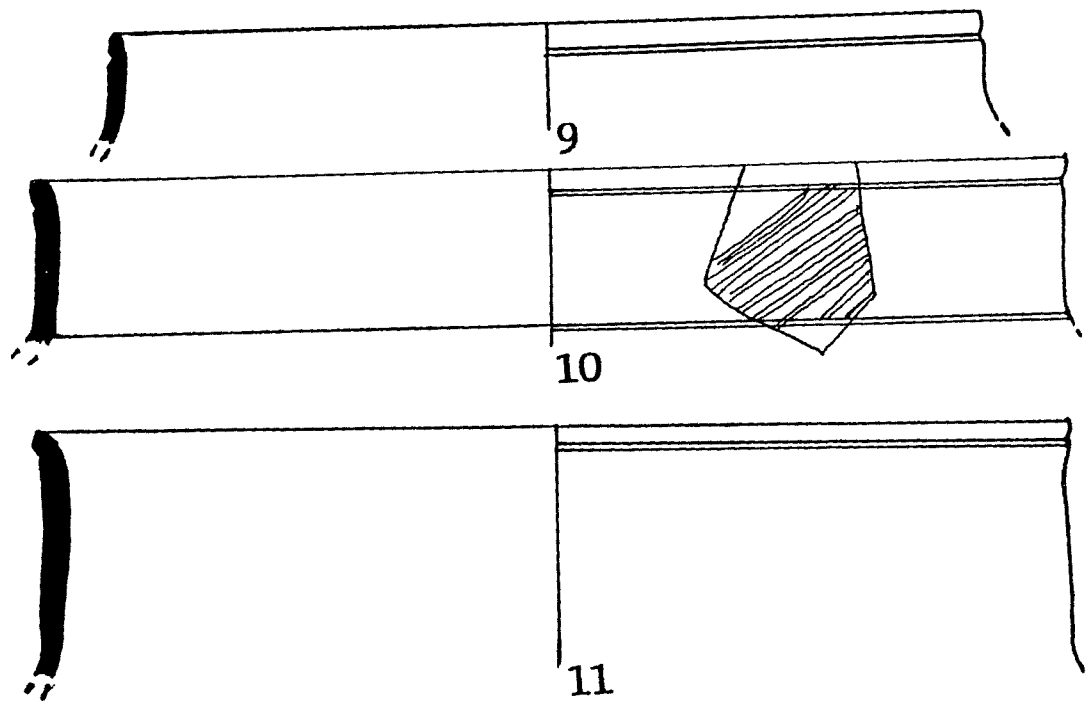
Chalcolithic pottery

WHITE PAINTED BLACK AND RED WARE

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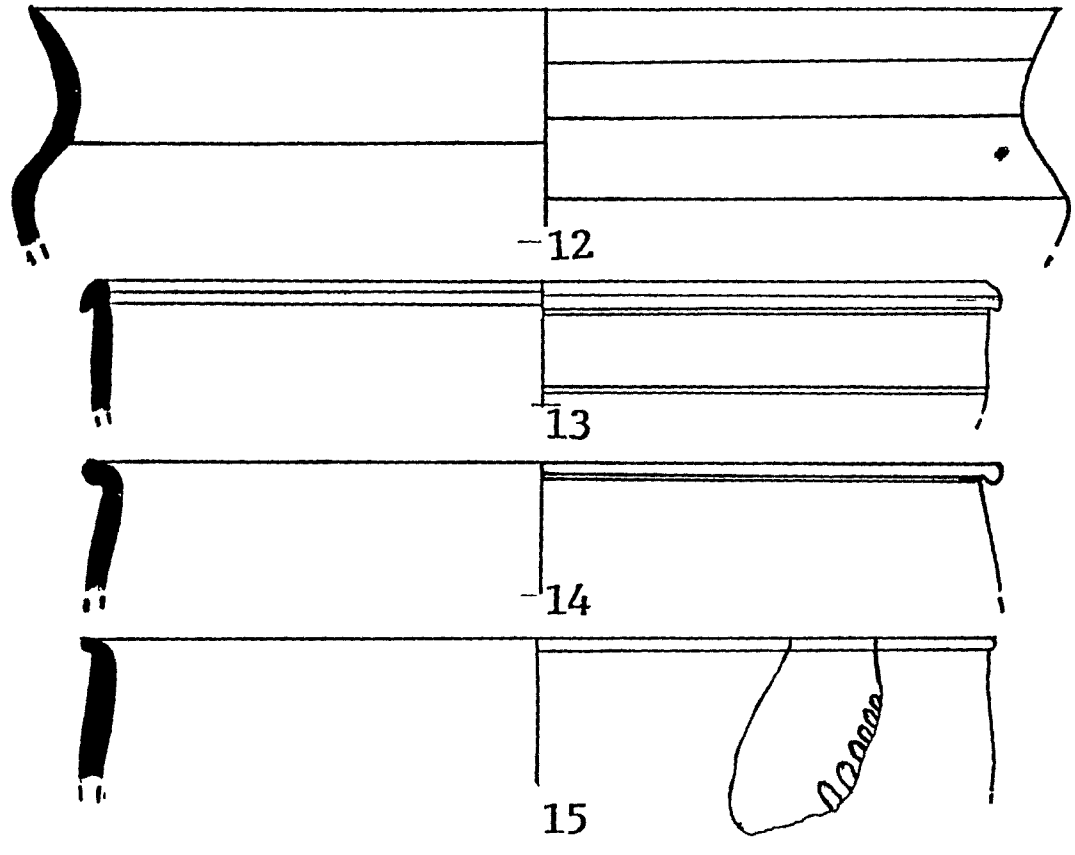
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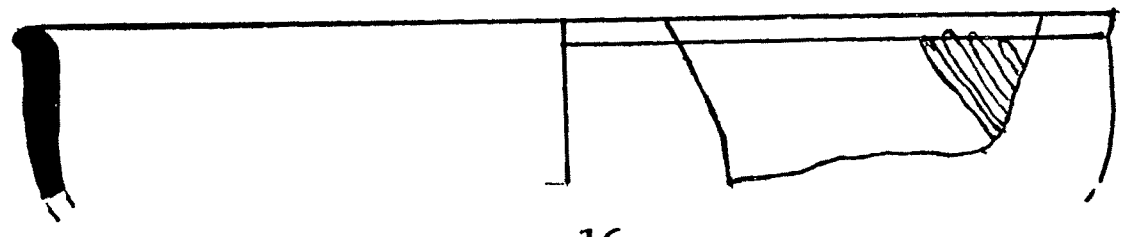

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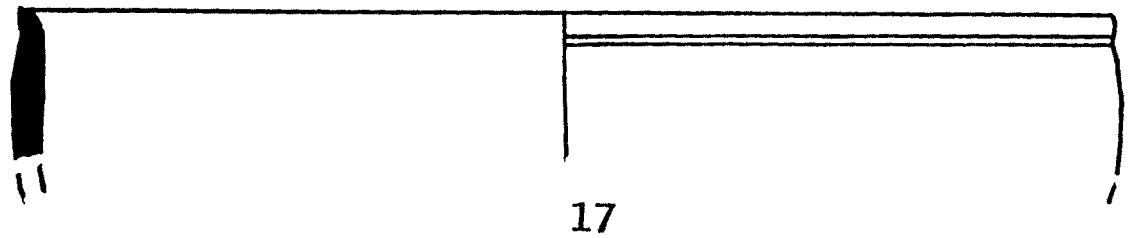

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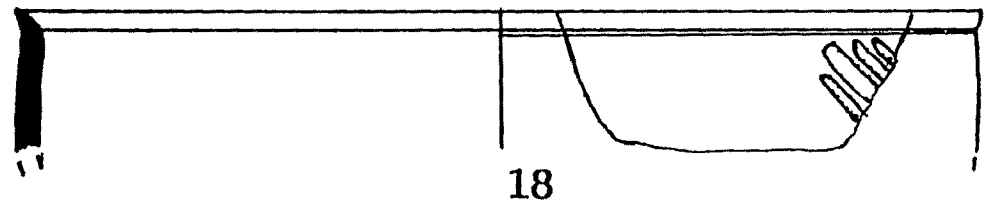

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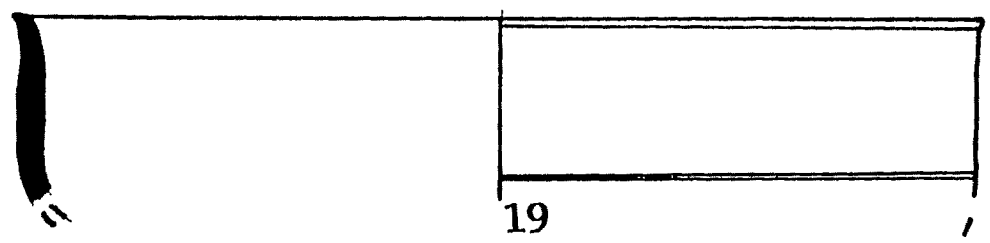

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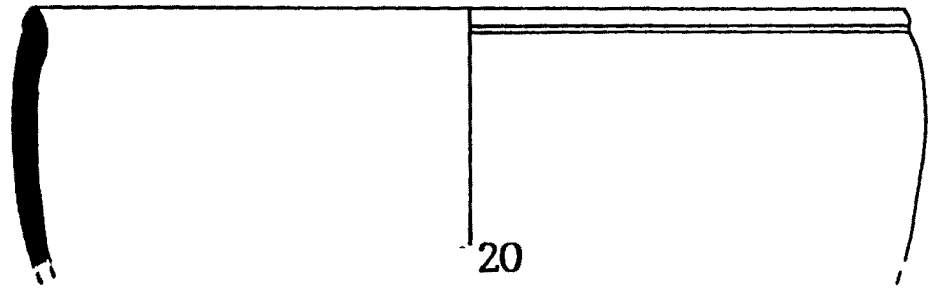

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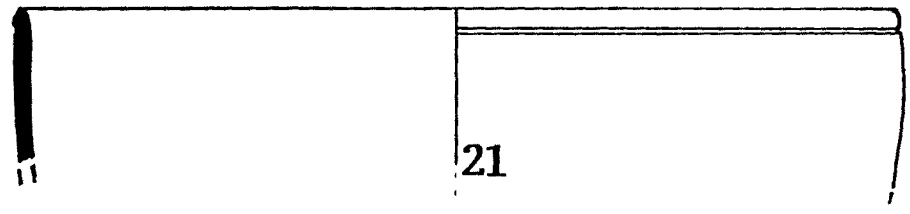

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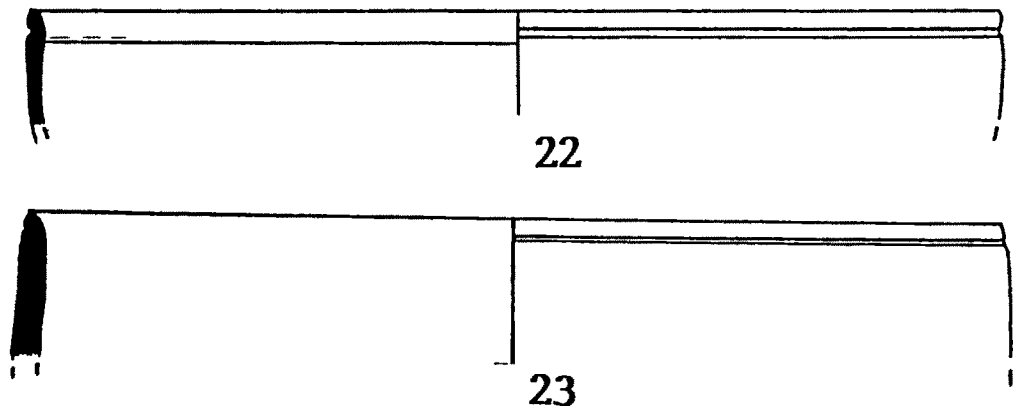

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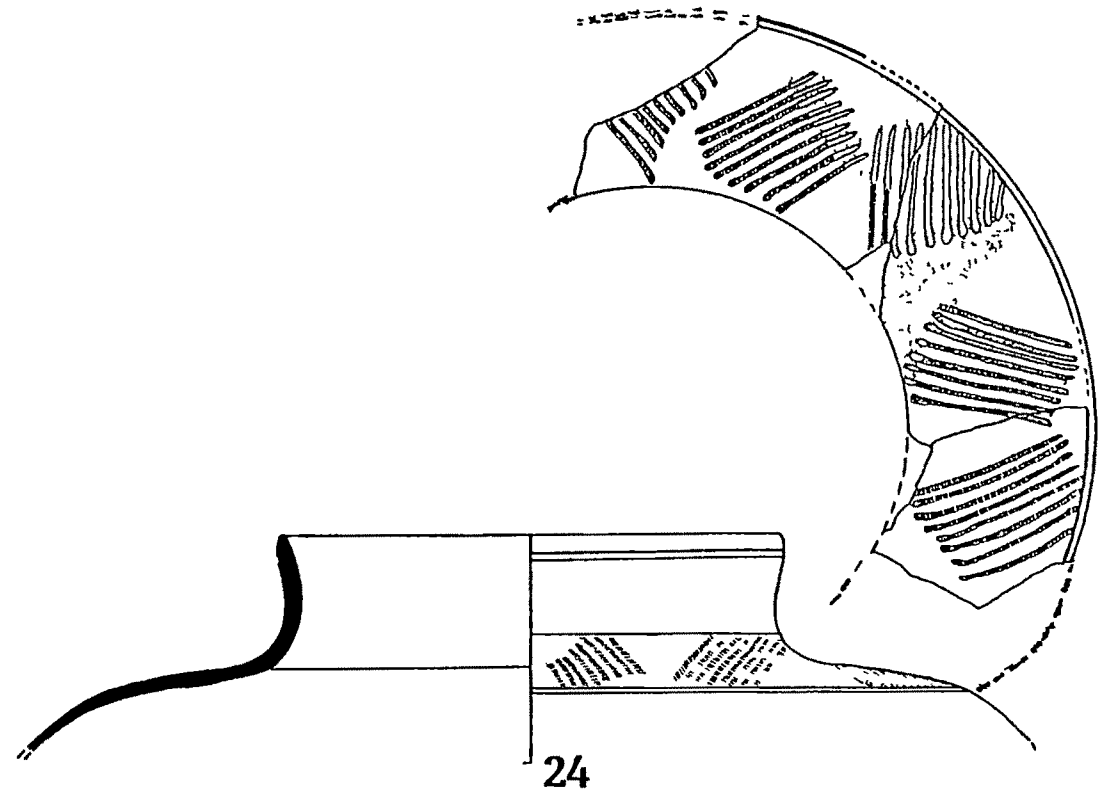

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Microliths from Neolithic sites (Upper Tungabhadra & Tunga valleys)

Figure I : Blade group

(1)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Quartz Tool type: Blade

Description: Symmetrical bladish flake. Short fluted scars and a deep flake scar near the cutting edge on the dorsal side. Concave ventral side has two flake scars near the edge. Prominent straight mid ridge. Thick faceted platform at the distal end. Thin and sharp working edges. Fresh. Measures 2.6 cm x 2 cm x 0.9 cm.

Comparable to: No. 24, Fig. 20, Kodekal (Paddayya, 1973).

(2)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Quartzite Tool type: Blade

Description: An irregular triangular shaped bladish flake. Shallow flake scars sloping towards the margin on the dorsal side. Prominent bulb of percussion on the ventral side. Faceted platforms each at the end. Prominent straight mid ridge. Working edge retouched on the slopy side of the dorsal side. Broad and thick near the bottom and thin at the top end. Fresh. Measures 2.7 cm x 2.1 cm x 0.9 cm.

Comparable to: No. 44, Fig. 20, Kodekal (Paddayya, 1973).

... 544

(3)

River valley : Tunga Site: Abbaragatte

Rock material: Quartz Tool type: Blade

Description: Rectangular bladish flake. Zigzag mid ridge and slopy sides on the dorsal side. Prominent bulb of percussion and depressed surface on the ventral side. Thin faceted platform at the top. Broad and slopy bottom. Thin and sharp working edges. Fresh. Measures 3.2 cm x 1.9 cm x 0.7 cm.

Comparable to: Variation of No. 1.

(4)

River valley : Upper Tungabhadra Site: Vaderpura

Rock material: Quartz Tool type: Blade

Description: Rectangular bladish flake. Parallel fluting marks and straight mid ridge on the dorsal side. Plain and concave ventral side. Faceted platform at the base. Single working edge. Fresh. Measures 2.2 cm x 1.3 cm x 0.5 cm.

Comparable to: Variation of No. 3.

(5)

River valley : Upper Tungabhadra Site: Anaveri

Rock material: Quartz Tool type: Retouched blade

Description: Short retouched bladish flake. Short multiple shallow flake scars on the dorsal side. Prominent bulb of percussion and depression at the centre on the ventral side. Both working edge and the bottom end retouched on the dorsal side. Fresh. Measures 2.4 cm x 1.4 cm x 0.5 cm.

Comparable to: Variation of No. 2.

... 545

(6)

River Valley : Upper Tungabhadra Site: Belimallur

Rock material: Quartz Tool type: Retouched blade

Description: Backed blade, roughly leaf shaped. Multiple fluting marks and prominent mid ridge on the dorsal side. Shallow flake scars on the ventral side. Retouched slopy working edge. Fresh. Measures 2.6 cm x 1.6 cm x 0.7 cm.

Rare type.

(7)

River valley : Upper Tungabhadra Site: Anaveri

Rock material: Rock crystal Tool type: Parallel sided blade.

Description: A short parallel sided blade. Fluting marks, shallow step flake scars and prominent mid ridge on the dorsal side. Nipped bulb of percussion and deliberate depression on the ventral side. Retouching confined to working edges. Faceted platform at the base. Fresh. Measures 1.9 cm x 0.9 cm x 0.5 cm.

Comparable to: No. 57, Fig. 68, Nagarjunakonda (Subramanyam, 1975).

(8)

River valley : Upper Tungabhadra Site: Hadonahalli

Rock material: Milky quartz Tool type· Parallel sided blade

Description: Short thin parallel sided blade. Prominent mid ridge and slopy sides on the dorsal side. Shallow flake scars on the ventral side. Retouching confined to one side of the thin working edge. Fresh. Measures 2.2 cm x 1.01 cm x 0.5 cm.

Comparable to: No. 30, Fig. 34, Brahmagiri (Wheeler, 1947).

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Figure II · Point group

(9)

River valley : Upper Tungabhadra Site· Halelingapura

Rock material: Quartzite Tool type· Symmetrical point

Description: Leaf shaped point made on a thick brownish black flake. Short fluting scars and shallow flaking on the dorsal side, besides a small patch of cortex. Nipped bulb of percussion on the ventral side. Base and tip retouched. Fresh. Measures 3.1 cm x 2.9 cm x 1 cm.

Comparable to: No. 3, Pl. XVII, Brahmagiri (Seshadri, 1956)

(10)

River valley : Upper Tungabhadra Site: Sasivehalli

Rock material: Quartzite Tool type Symmetrical point

Description: Leaf shaped point made on a greyish Levalloisian flake. Shallow flake scars converge at the middle on the dorsal side. Nipped bulb of percussion on the ventral side. Thin and sharp tip obtained by removing a small flake on the dorsal side. Symmetrical margins, faceted platforms one each on the left and right lateral margins. Thick at the centre. Fresh. Measures 3 cm x 2.7 cm x 1 cm.

Comparable to: Variation of No. 9.

(11)

River valley : Upper Tungabhadra Site· Benakanahalli

Rock material: White quartz Tool type: Tanged point

Description: Symmetrical point made on a thin quartz flake. Numerous pressure flake scars on both the dorsal and ventral sides. Point attained by removing a flake at oblique angle along the left margin. Tip retouched from both the sides. Small tang with shoulders near the base indicates hafting. Fresh. Measures 3.2 cm x 2.8 cm x 0.9 cm.

Comparable to: No. 32, Fig. 20, Kodekal (Paddayya, 1973).

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(12)

River valley : Upper Tungabhadra Site: Belımallur
Rock material: Quartz Tool type: Asymmetrıcal poınt

Descrıptıon: Small point made on a thın blade. Medıan ridge and slopy ends on the dorsal side. Numerous pressure flake scars on the ventral sıde and on the tip. Faceted platform at the base. Straight margins upto mıddle and tapers towards the curved and sharp tıp. Measures 2 cm x 1.3 cm x 0.8 cm.

Comparable to: No. 42, Pl. XIII, Jalahallı (Seshadrı, 1956).

(13)

Rıver valley : Upper Tungabhadra Sıte: Belımallur
Rock materıal: Quartz Tool type: Asymmetrıcal poınt

Descrıptıon: Medıum sized ırregular poınt made on a thın blade. Short flutıng scars on the dorsal sıde. Prominent bulb of percussıon on the ventral side. Poınted tıp attaıned by removıng a small flake at oblıque angle near the tıp on the left lateral sıde. Convex left margın and straight rıght margın. Fresh. Measures 2.4 cm x 1.4 cm x 0.6 cm.

Comparable to: No. 31, Fıg. 20, Kodekal (Paddayya, 1973).

(14)

Rıver valley : Upper Tungabhadra Sıte: Halelıngapura
Rock materıal: Quartz Tool type: Borer

Descrıptıon: Made on an ırregular flake. Numerous pressure flake scars slope towards the margın on all the sıdes except a small patch of cortex at the centre, on the dorsal sıde. Deep flake scar near the left sıde margın on the ventral sıde. Workıng poınt at the mıddle obtaıned by removıng small flakes from ventral sıde. Fresh. Measures 3.2 cm x 2.5 cm x 0.9 cm.

Rare type.

... 548

Figure III · Scraper group

(15)

River valley : Upper Tungabhadra Site: Anaveri

Rock material: Quartz Tool type: Side scraper

Description: Oval shaped; made on a bladish flake. Fluting scars and pressure flake scars with prominent median ridge on the dorsal side. Nipped bulb of percussion and pressure flake scars on the ventral surface. Both the margins retouched and converge gradually at the far end. Cortex patch retained at the base as faceted platform. Fresh. Measures 3.5 cm x 2.6 cm x 0.9 cm.

Comparable to: No. 1, Pl. XIV, Jalahalli (Seshadri, 1956).

(16)

River valley : Tunga Site· PIlangere

Rock material: Quartz Tool type· Side scraper

Description: Made on a thick short bladish flake. Short fluting scars on the dorsal side. Pressure flake scars on the ventral surface. Secondary retouching of the right lateral margin from the ventral side. Zigzag working edge. Fresh. Measures 2.1 cm x 2 cm x 0.9 cm.

Comparable to: No. 12, Fig. 68, Nagarjunakonda (Subramanyam, 1975).

(17)

River valley : Upper Tungabhadra Site· Vaderpura

Rock material: Quartz Tool type· Side scraper

Description: Made on an irregular thin flake. Short fluting scars and pressure flake scars on the dorsal side. Concave ventral surface. Left lateral margin almost straight and exhibits retouching done from both the sides. Retouched right side margin. Cutting edge margin bears signs of wear and tear. Fresh. Measures 3.2 cm x 2.2 cm x 0.6 cm.

Comparable to: No. 75, Fig. 68, Nagarjunakonda (Subramanyam, 1975).

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(18)

River valley : Upper Tungabhadra — Site: Vaderpura

Rock material: Quartz — Tool type: Hollow scraper

Description: Triangular in shape. Pressure flake scars on the dorsal side. Hollow concave left lateral margin on the dorsal side. Nipped bulb on the ventral side. Striking platform near the base. Fresh. Measures 3.6 cm x 3.1 cm x 1.1 cm.

Comparable to: No. 44, Fig. 20, Kodekal (Paddayya, 1973).

(19)

River valley . Tunga — Site: Pilangere

Rock material: Quartz — Tool type: Core scraper

Description: Made on a small sized pebble. Shallow flake scars near the margins converging at the middle with prominent median ridge and small patch of cortex on the dorsal side. Pressure flake scars on the ventral side. Zigzag convex left lateral margin and straight right margin. Fresh. Measures 3.6 cm x 2.6 cm x 1.5 cm.

Comparable to: No. 8, Pl. XVIII, Kibbanahalli (Seshadri, 1956).

(20)

River valley : Upper Tungabhadra — Site: Vaderpura

Rock material: Quartz — Tool type: Core

Description: Small roundish core. Shallow flake scars on both the dorsal and ventral sides from middle upwards. Cortex retained in the remaining portion.

Comparable to: No. 45, Fig. 21, Kodekal (Paddayya, 1973).

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NEOLITHIC TOOL TYPES

Figure I : Unfinished flakes

(1)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Talk chlorite schist Tool type: Unifacially worked flake

Description: Triangular shaped flake. Shallow flake scars at the middle and step flake scars along the periphery on the upper side. Zigzag prominent mid ridge. Deliberate depression on the lower side. Symmetrical margins. Fresh. Measures 14 cm x 8 cm x 4.02 cm.

Rare type.

(2)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Talc chlorite schist Tool type: Unifacially worked flake

Description: Triangular shaped flake with protruded upper side. Step flake scars, cortex patch retained near the bottom. Deliberate depression on the ventral side. Thin and sharp edge. Measures 15.4 cm x 9.1 cm x 5 cm.

Rare type.

(3)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Talk chlorite schist Tool type: Uncially worked flake

Description: Triangular shaped flake. Deep flake scars and patch of cortex on the protruded upper surface. Depression on the lower surface. Thick at the bottom. Fresh. Measures 15.5 cm x 7.9 cm x 4.7 cm.

Rare type.

... 551

(4)

River valley : Upper Tungabhadra — Site: Belimallur

Rock material: Talc chlorite schist — Tool type: Bifacially worked core

Description: Oval shaped. Numerous shallow flake scars on the protruded upper surface. Shallow flake scars on the concave lower surface. Symmetrical margin. Thick at the centre. Fresh. Measures 12 cm x 6.5 cm x 4.3 cm.

Rare type.

(5)

River valley : Upper Tungabhadra — Site: Belimallur

Rock material: Talc chlorite schist — Tool type: Bifacially worked flake

Description: Triangular shaped; shallow flke scars, deep negative percussion and patch of cortex retained on the upper side. Prominent mid ridge and shallow flake scars on the lower side. Zigzag left margin. Right side margin almost straight. Broad working end. Narrow butt end. Fresh. Measures 16 cm x 8.02 cm x 4 cm.

Rare type.

(6)

River valley : Upper Tungabhadra — Site: Haraganahalli

Rock material: Talk chlorite schist — Tool type: Bifacially worked core

Description: Sub-triangular shaped. Shallow step flake scars on both the upper and lower sides. Thick at the centre. Broad working end and narrow butt end. Unfinished. Fresh. Measures 13.5 cm x 8 cm x 6.3 cm.

Rare type.

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Figure II : Polished stone axe group

(7)

River valley : Upper Tungabhadra — Site: Nagasamudra

Rock material: Talc chlorite schist — Tool type: Edge ground and pecked axe.

Description: Symmetrical triangular axe with pointed butt end. Crescentic working edge polished from both the sides and blunt with solitary flake scar. Remaining surface pecked from all the sides. Ovoid in section. Measures 12.09 cm x 6.2 cm x 9 cm.

Comparable to: B(i)a, Fig. 32, Brahmagiri (Wheeler, 1947).

(8)

River valley : Upper Tungabhadra — Site: Hadonahalli

Rock material: Talk chlorite schist — Tool type: Edge ground axe

Description:Sub-triangular shaped; round butt end, blunt crescentic cutting edge, polished from both the sides. Step flake scars on both the surfaces. Twisted right side margin. Straight left margin. Deliberate protrusion on the upper side. Ovoid in section. Measures 13.02 cm x 6.04 cm x 3 cm.

Comparable to: No. 2, Fig. 22, Hallur (Nagaraja Rao, 1971).

(9)

River valley : Upper Tungabhadra — Site Holehatti

Rock material: Talk chloritic schist — Tool type: Edge ground axe

Description: Triangular shaped; uneven blunt butt end; sharp crescentic edge and highly ground on both the surfaces. Pecking on sides. Step flake scars on both the upper and lower surfaces. Slightly protruded upper surface. Ovoid in section. Measures 15.05 cm x 7.07 cm x 3 cm.

Comparable to: A(III)a, Brahmagiri (Wheeler, 1947).

(10)

River valley : Upper Tungabhadra — Site: Hadonahalli

Rock material: Talk chlorite schist — Tool type: Ground stone axe

Description: Triangular shaped; rounded butt. Convex right side margin. Protruded upper face. Regular depression on the lower side, shallow flake scars and polished surface on both the sides. Convex cutting edge. Ovoid in section. Measures 12.5 cm x 6.05 cm x 2.07 cm.

Comparable to: No. 3, Fig. 22, Hallur (Nagaraja Rao, 1971).

(11)

River valley : Upper Tungabhadra — Site: Hadonahalli

Rock material: Talk chlorite schist — Tool type: Ground stone axe

Description: Sub-triangular in shape; shallow scars near the working edge on both the upper and lower sides. Round butt end and blunted crescentic cutting edge. Ovoid in section. Symmetrical; medium size. Measures 11.4 cm x 7 cm x 3 cm.

Comparable to: No. 13, Pl. 27, T. Narasipur (Seshadri, 1971).

(12)

River valley : Tunga — Site: Pilangere

Rock material: Talk chlorite — Tool type: Ground stone axe

Description: Triangular in shape. Grounded surfaces. Rounded butt end; sharp and thin working edge almost straight. Plano convex in section. Small in size. Measures 8.5 cm x 4.2 cm x 1.5 cm.

Rare type.

... 554

(13)

River valley : Upper Tungabhadra — Site: Hadonahalli

Rock material: Talk chlorite schist — Tool type: Pecked stone axe

Description: Triangular shaped; rounded butt end. Thin and straight working edge. Protruded upper surface. Deep flake scar on the lower side. Right longitudinal margin longer than the left side margin. Pecked all over. Ovoid in section. Measures 14 cm x 7.05 cm x 3.05 cm.

Comparable to: No. 6, Pl. 35, T. Narasipur (Seshadri, 1971).

(14)

River valley: Tunga — Site: Sulebailu

Rock material: Trap — Tool type: Ground stone axe

Description: Triangular shaped. Crescent shaped blunt working edge. Pointed butt end; well ground. Ovoid in section. Medium size. Measures 15 cm x 6 cm x 4.05 cm.

Comparable to: No. 8, Pl.35, T. Narasipur (Seshadri, 1971).

(15)

River valley : Upper Tungabhadra — Site: Haraganahalli

Rock material: Talk chlorite schist — Tool type· Edge ground and pecked axe

Description: Triangular shaped. Convex blunted working edge polished from both the sides. Pecked all over the undulated surface. Slightly blunted pointed butt end. Ovoid in section. Measures 13 cm x 6.08 cm x 3.8 cm.

Comparable to: No. A(iii), Fig. 32, Brahmagiri (Wheeler,1947).

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(16)

River valley : Upper Tungabhadra — Site: Hadonahalli

Rock material: Talk chlorite schist — Tool type: Ground stone axe

Description: Sub-triangular shaped; shallow flake scars along the broad crescent like cutting edge on both the surfaces. Point butt end. Symmetrical margin. Well ground. Ovoid in section. Measures 11.2 cm x 7.2 cm x 4 cm.

Comparable to: No. A(i), Fig. 32, Brahmagiri (Wheeler, 1947).

(17)

River valley : Upper Tungabhadra — Site: Didaguru

Rock material: Talk chlorite schist — Tool type· Ground axe

Description: Roughly triangular shaped, shallow flake scars on the upper, lower surfaces. Flake scars along the blunted edge indicates reuse. Symmetrical margin. Rounded butt. Circular in section. Measures 15 cm x 6.5 cm x 5.1 cm.

Comparable to: No. 5, Fig. 22, Hallur (Nagaraja Rao, 1971).

(18)

River valley : Upper Tungabhadra — Site: Hadonahalli

Rock material: Talk chlorite schist — Tool type: Ground stone axe

Description: Triangular shaped; shallow flake scars on both the surfaces. Polished surface visible in patches on both the sides. Rounded butt end. Convex edge blunted due to flake scars. Concave left margin. Ovoid in section. Measures 12.9 cm x 7.5 cm x 4.6 cm.

Comparable to: No. 5, Fig. 22, Hallur (Nagaraja Rao, 1971).

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(19)

River valley : Upper Tungabhadra Site: Nimbegondi

Rock material: Talk chlorite schist Tool type: Ground stone axe

Description: Triangular shaped; well ground body. Shallow flake scars along the broad convex edge indicates reuse. Symmetrical margin. Rounded butt. Ovoid in section. Measures 11.5 cm x 7.1 cm x 3.8 cm.

Comparable to: No. B(1), Fig. 32, Brahmagiri (Wheeler, 1947).

(20)

River valley : Tunga Site: Sulebailu

Rock material: Trap Tool type: Pecked stone axe

Description: Triangular shaped; blunt butt end, pecked all over the surface. Straight cutting edge. Circular in cross section. Measures 12 cm x 4.5 cm x 3.05 cm.

Comparable to: No. 5, Fig. 17, Kodekal (Paddayya, 1973).

Figure III : Adze

(21)

River valley : Upper Tungabhadra Site: Hadonahalli

Rock material: Talk chlorite schist Tool type: Adze

Description: Sub-triangular shaped. Deliberate protrusion on the upper side at the middle. Zigzag right lateral margin. Rounded butt, straight and thin working edge. Rectangular in section, medium size. Measures 10 cm x 5.06 cm x 2.05 cm.

Comparable to: No. 6, Fig. 22, Hallur (Nagaraja Rao, 1971).

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(22)

River valley : Upper Tungabhadra Site: Hole Hanasavadi

Rock material: Talk chlorite schist Tool type: Adze

Description: Polished upper surface. Protruded dorsal side. Shallow flake scars on the lower surface. Blunt crescentic working edge. Round butt end. Ovoid in section. Measures 8.6 cm x 5 cm x 2.5 cm.

Comparable to: No. 7, Fig. 22, Hallur (Nagaraja Rao, 1971).

Figure IV : Chisel

(23)

River valley : Upper Tungabhadra Site: Nimbegondi

Rock material: Talk chlorite schist Tool type: Chisel

Description: Sub-triangular shaped; pecked body; symmetrical margin. Rounded butt. Bevelled, sharp and ground cutting edge. Ovoid in section. Measures 7.8 cm x 5 cm x 2 cm.

Comparable to: No. 8, Fig. 22, Hallur (Nagaraja Rao, 1971).

(24)

River valley : Upper Tungabhadra Site: Holehatti

Rock material: Talk chlorite schist Tool type: Chisel

Description: Roughly rectangular shaped; shallow flake scars and grounded surface on both the sides. Thin, sharp cutting edge almost straight. Flat butt end. Symmetrical margins. Ovoid in section. Measures 6.5 cm x 5 cm x 2.1 cm.

Comparable to· No. 3, Pl. 35, T. Narasipur (Seshadri, 1971).

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(25)

River valley : Upper Tungabhadra Site: Nagasamudra

Rock material: Talc chlorite schist Tool type: Chisel

Description: Triangular shaped. Body ground all over. Rounded butt. Straight and sharp cutting edge. Ovoid in section. Medium size. Measures 8.5 cm x 3.08 cm x 2 cm.

Comaprable to: No. 2, Pl. 35, T. Narasipur (Seshadri, 1971).

(26)

River valley : Upper Tungabhadra Site: Haraganahalli

Rock material: Talk chlorite schist Tool type· Chisel

Description: Roughly oval shaped. Both the surfaces polished. Flake scars on the lower side indicates reflaking. Faceting on the left side margin. Flat butt end. Straight and sharp cutting edge. Ovoid in section. Measures 6.6 cm x 4.6 cm x 2.3 cm.

Comparable to: Varation of No. 23.

Figure V : Wedge

(27)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Talk chlorite schist Tool type: Unfinished wedge

Description: Oval shaped. Pecked body. Protruded upper surface. Symmetrical margin. Both top and bottom ends are flat. Ovoid in section. Measures 10.5 cm x 6.4 cm x 4.6 cm.

(28)

River valley : Upper Tungabhadra — Site: Kattehalu

Rock material: Talk chlorite schist — Tool type: Unfinished wedge

Description: Roughly triangular shaped. Shallow flake scars and patch of a cortex on the upper surface. Uneven lower surface and sides. Rounded butt end. Flat base. Measures 10.5 cm x 7 cm x 5.1 cm.

Comparable to: No. 9, Fig. 17, Kodekal (Paddayya, 1973)

(29)

River valley : Upper Tungabhadra — Site: Belimallur

Rock material: Talk chlorite schist — Tool type: Wedge

Description: Rectangular shaped; shallow flake scars on both the surfaces. Patch of a grounded surface on both the sides. Flat butt end. Crescentic, blunt cutting edge. Ovoid in section. Measures 9.9 cm x 8.5 cm x 4.7 cm.

Rare type.

(30)

River valley : Upper Tungabhadra — Site: Halelingapura

Rock material: Talk chlorite schist — Tool type: Wedge

Description: Oval shaped; seems to have been part of an axe. Body pecked all over edge ground on both the surfaces. Shallow flake scars near the top on both the sides. Flattened butt and blunted semi-circular cutting edge. Ovoid in section. Medium size. Measures 9.6 cm x 7.5 cm x 4.5 cm.

Comparable to: No. 1, Fig. 23, Hallur (Nagaraja Rao, 1971).

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(31)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Talk chlorite schist Tool type: Wedge

Description: Oval shaped; made on a small nodule. Body ground all over. Flake scars on one side. Both butt and working edge semi-circular and pecked. Ovoid in section. Small size. Measures 7 cm x 5.5 cm x 3.5 cm.

Comparable to: No. 25, Pl. 30 A, T. Narasipur (Seshadri, 1971).

(32)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Talk chlorite schist Tool type: Wedge

Description: Oval shaped; made on a nodule. Ground all over. Flakes near the edge exhibits constant use. Circular butt end and battered blunt edge. Ovoid in section. Medium size. Measures 8 cm x 5.7 cm x 3.5 cm.

Comparbale to: No. 3, Fig. 23, Hallur (Nagaraja Rao, 1971).

Figure VI : Rubber

(33)

River valley : Upper Tungabhadra Site: Didaguru

Rock material: Sand stone Tool type: Rubber

Description: Made on a thick flake; oval in shape. Sides and upper surface pecked. Flat smooth lower surface indicates constant use. Plano-convex in section. Measures 14 cm x 13.3 cm x 2.6 cm.

Comparable to: No. 7, Pl. 30 B, T. Narasipur (Seshadri, 1971).

(34)

River valley : Upper Tungabhadra — Site: Haraganahalli

Rock material: Talk chlorite schist — Tool type: Rubber

Description: Made on a thick flake. Oval in shape; upper surface undulated and pecked. Flat and smooth lower surface due to constant use. Curved side margins. Semi-circular ends. Shallow flake scars at the distal end. Ovoid in section. Measures 13.2 cm x 9 cm x 3 cm.

Comparable to: No. 4, Pl. IX, Hallur (Nagaraja Rao, 1974).

(35)

River valley : Upper Tungabhadra — Site: Didaguru

Rock material: Sand stone — Tool type· Rubber

Description: Oval shaped; broken; pecked upper surface. Smooth uuder surface indicates constant use. Ovoid in section. Measures 12.3 cm x 9.8 cm x 4.9 cm.

Comparable to: No. 4, Pl. CXVI, Brahmagiri (Wheeler, 1947).

Figure VII : Hammer stone

(36)

River valley : Upper Tungabhadra — Site: Didaguru

Rock material: Talk chlorite schist — Tool type: Hammer stone

Description: Made on a nodule, almost triangular shaped. Ground all over. Battered working ends. Roughly triangular in section. Measures 9 cm x 7.2 cm x 5.9 cm.

Rare type.

... 562

(37)

River valley : Upper Tungabhadra Site: Belimallur

Rock material: Talc chlorite schist Tool type: Hammer stone

Description: Rectangular shaped; made on a nodule. Ground all over. Semi-circular and smooth ends. Straight side margins. Rectangular in section. Medium size. Measures 9.3 cm x 4.8 cm x 4.8 cm.

Comparable to: No. 26, Pl. 30 A, T. Narasipur (Seshadri, 1971).

(38)

River valley : Tunga Site: Holebenavalli

Rock material: Talc chlorite schist Tool type: Hammer stone

Description: Made on a nodule of irregular shape. Ground and pecked surface. Flat bottom end. Smooth working ends. Rectangular in section. Measures 7.5 cm x 6.5 cm x 6.5 cm.

Comparable to: No. 3, Pl. XIII, Hemmige (H. Rao, Nagaraju, 1974).

Figure VIII : Ring stone, sling ball and quern

(39)

River valley : Upper Tungabhadra Site: Hadonahalli

Rock material: Sand stone Tool type: Mace head or ring stone

Description: Half portion of a circular shaped ring stone, made on a thick chunk. Pecked outer body and upper surface. Smooth lower surface. Wide groove at the centre. Rectangular in section. Measures Dia: outer 12.5 cm; inner 5.3 cm; thickness 5 cm.

Rare type.

... 563

(40)

River valley : Upper Tungabhadra Site: Didaguru

Rock material: Dolerite Tool type: Sling ball

Description: Circular shaped; medium size. Pecked all over. The size indicates that it could not have been used as a pounder. Circular in section. Measures 155 mm in circumference.

Comparable to: No. 19, Pl. 30-A, T. Narasipur (Seshadri, 1971).

(41)

River valley : Upper Tungabhadra Site: Abbaragatte

Rock material: Talc chlorite schist Tool type: Sling ball

Description: Roughly circular shaped; smooth surface all over. Plano-convex in section. Measures 6.5 cm in dia. and 5 cm in thickness.

Comparable to: No. 10, Pl.XIII, Hemmige (H. Rao, Nagaraju, 1974).

(42)

River valley : Upper Tungabhadra Site: Didaguru

Rock material: Talc chlorite schist Tool type: Saddle quern

Description: Portion of an oval shaped concave quern. Smooth depressed surface indicates constant use. Uneven outer body. Rounded border.

Comparable to: No. 14, Pl. CXVII, Brahmagiri (Wheeler, 1947)

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(43)

River valley : Upper Tungabhadra Site: Haraganahalli

Rock material: Chlorite schist Tool type: Saddle quern

Description: Portion of an oval shaped quern having rectangular sectioned border. Concave at the centre due to constant use. Smooth bottom surface.

Comparable to: No.13, Pl. CXVII, Brahmagiri (Wheeler, 1947).

MICROLITHS FROM THE NEOLITHIC SITES

Illustrations

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Fig. I : Blade group

Fig. II : Point group

Fif. : Scraper group

Note : a) Sl.No. of tools mentioned in the description are common to both drawings and plates.

b) Scale:; 1 : 1

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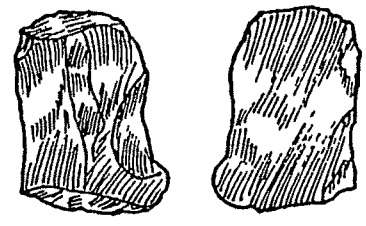
MICROLITHS FROM NEOLITHIC SITES
(UPPER TUNGABHADRA AND TUNGA VALLEYS)

FIG. I: BLADE GROUP



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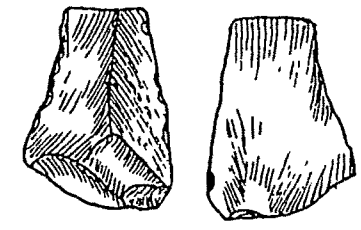

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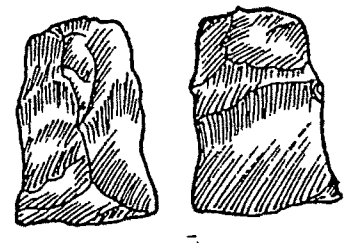

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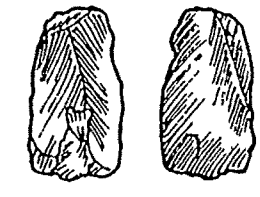

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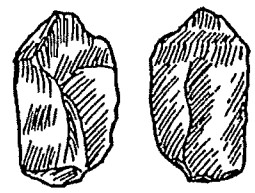

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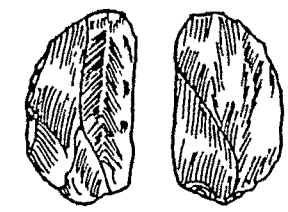

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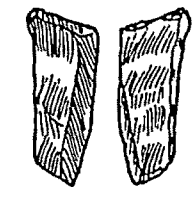

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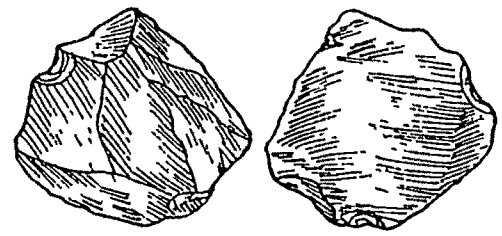
FIG. II: POINT GROUP



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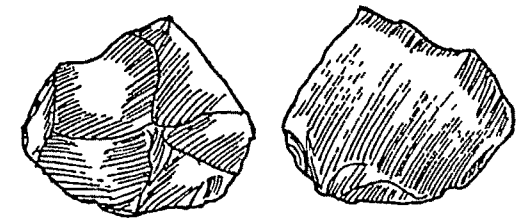

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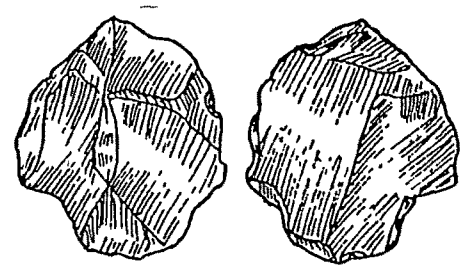

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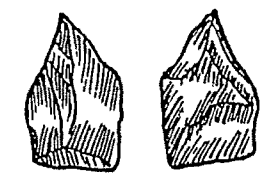

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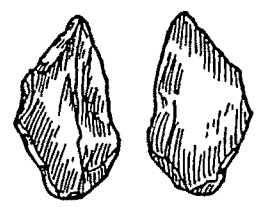

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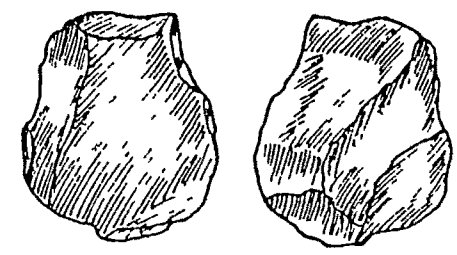

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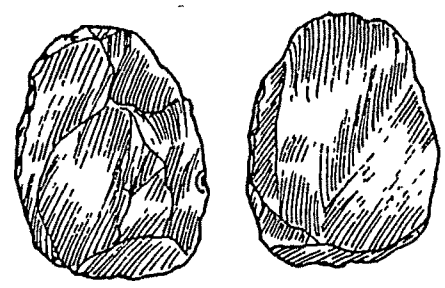
FIG. III: SCRAPER GROUP



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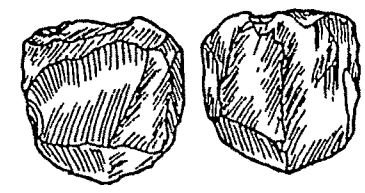

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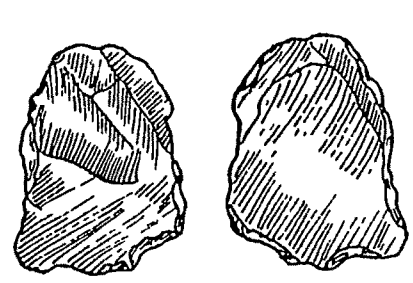

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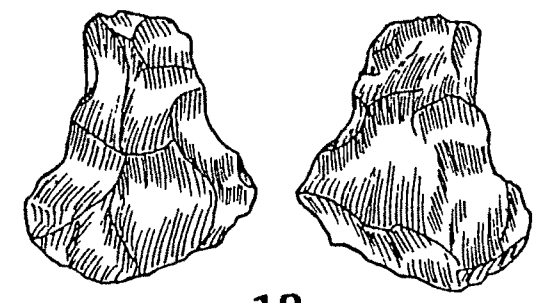

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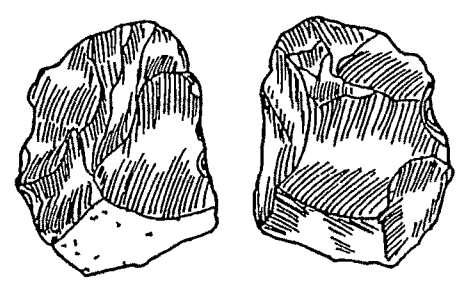

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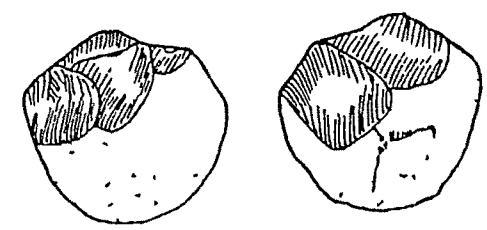

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NEOLIHIC TOOL TYPES

Illustrations

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Note : a) Serial numbers mentioned in the description are common to drawings as well as plates.

b) Scale of illustrations (drawings):

Sl. Nos. 27 to 35 are drawn to 1:3/5

Sl. Nos. 1 to 20, 42 & 43 are drawn to 1:2/3

Sl. Nos. 21 & 36 to 41 are drawn to 1:3/4

Sl. Nos. 22 to 26 are drawn to 1:1

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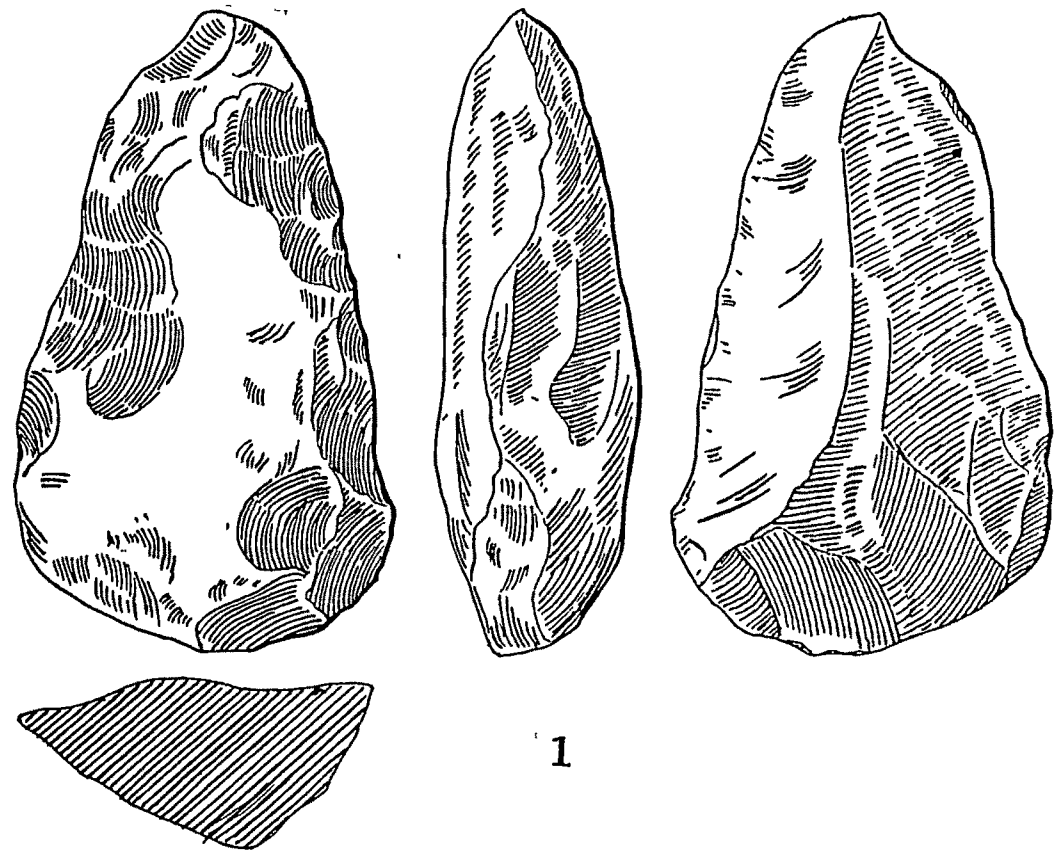
FIG. I: UNFINISHED FLAKES



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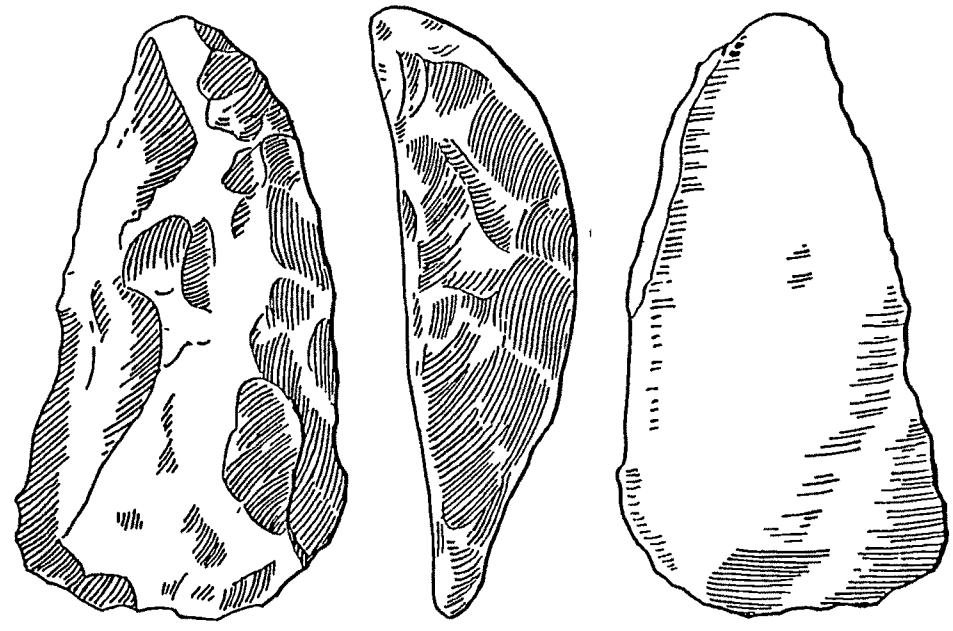

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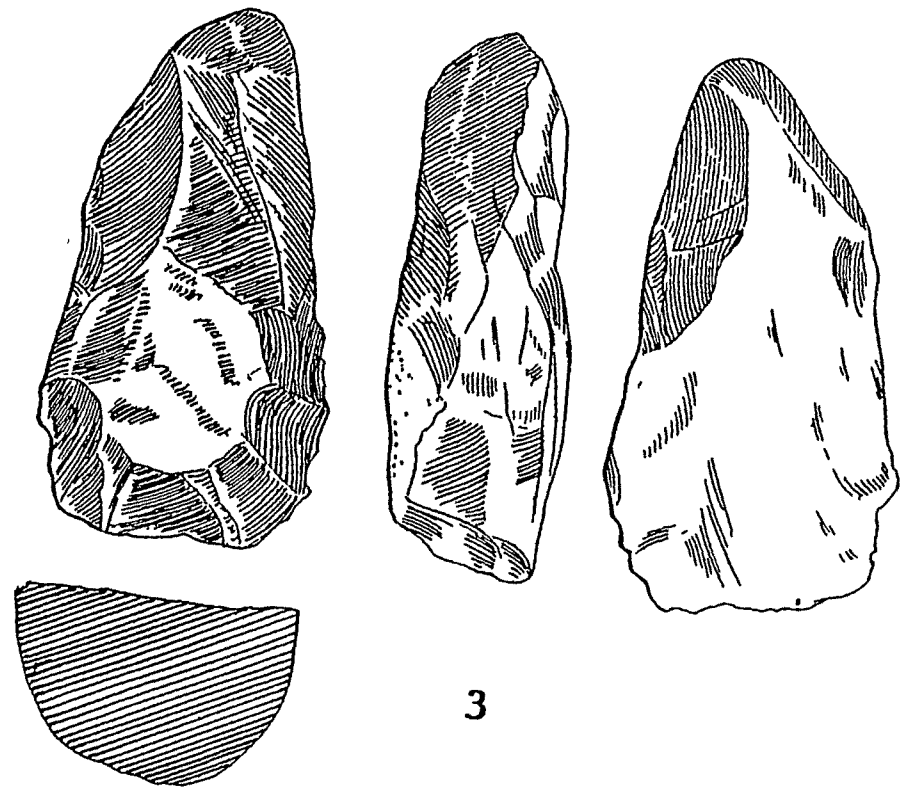

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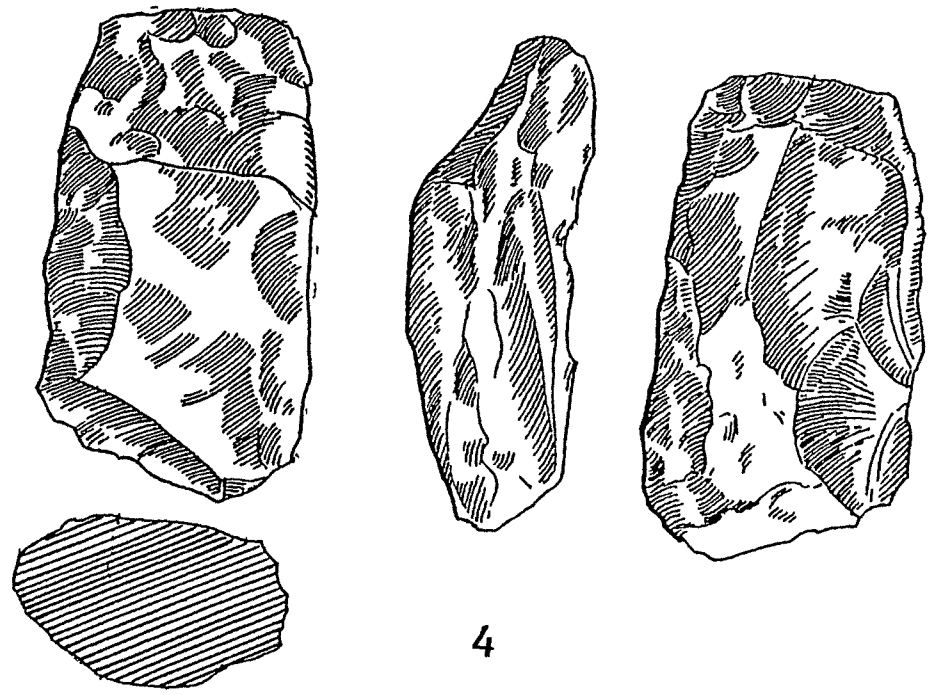

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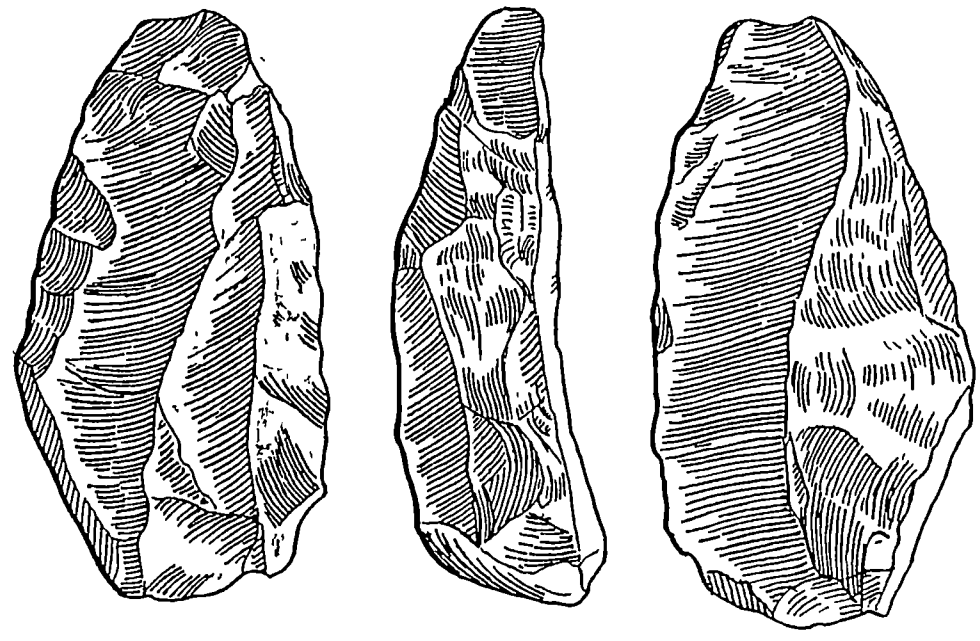

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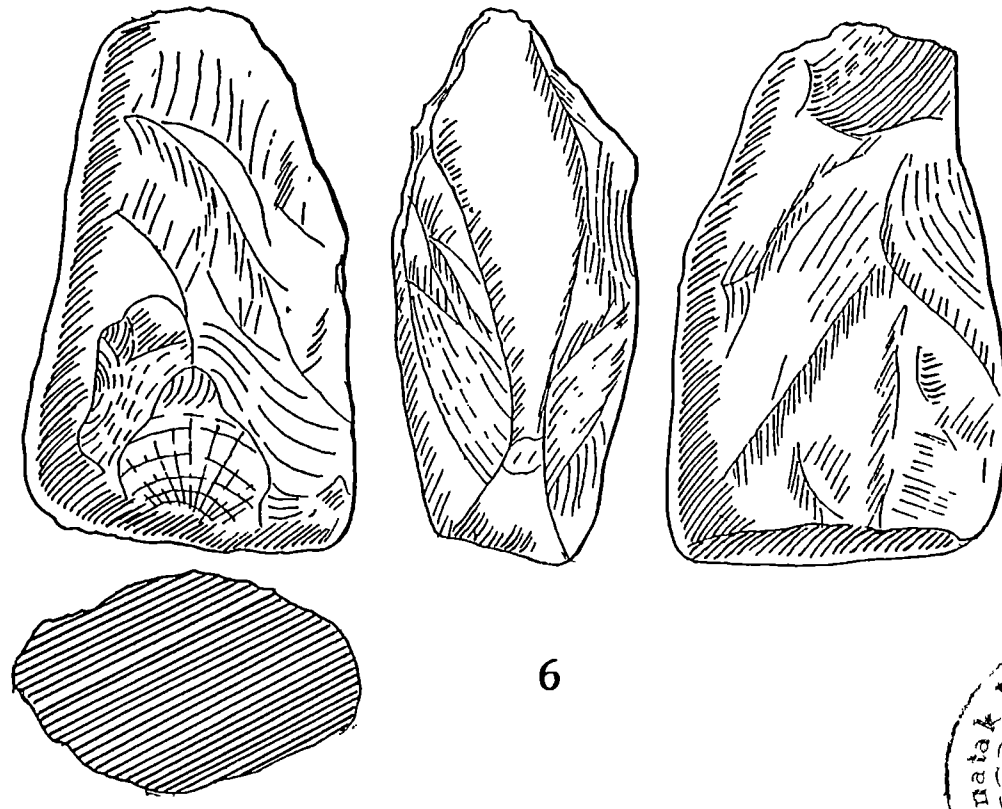

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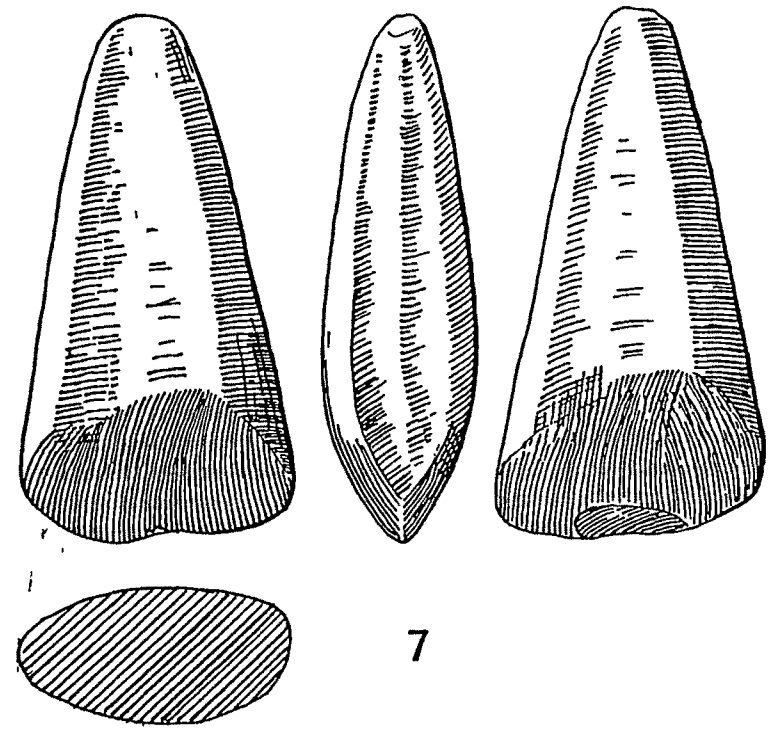
FIG. II: POLISHED STONE AXE GROUP



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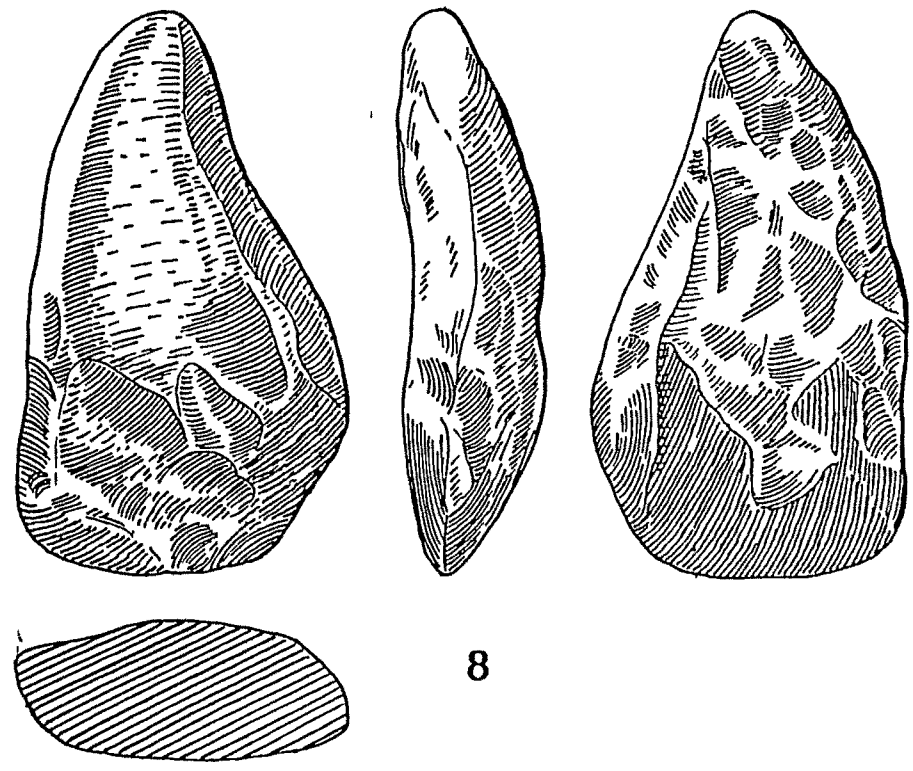

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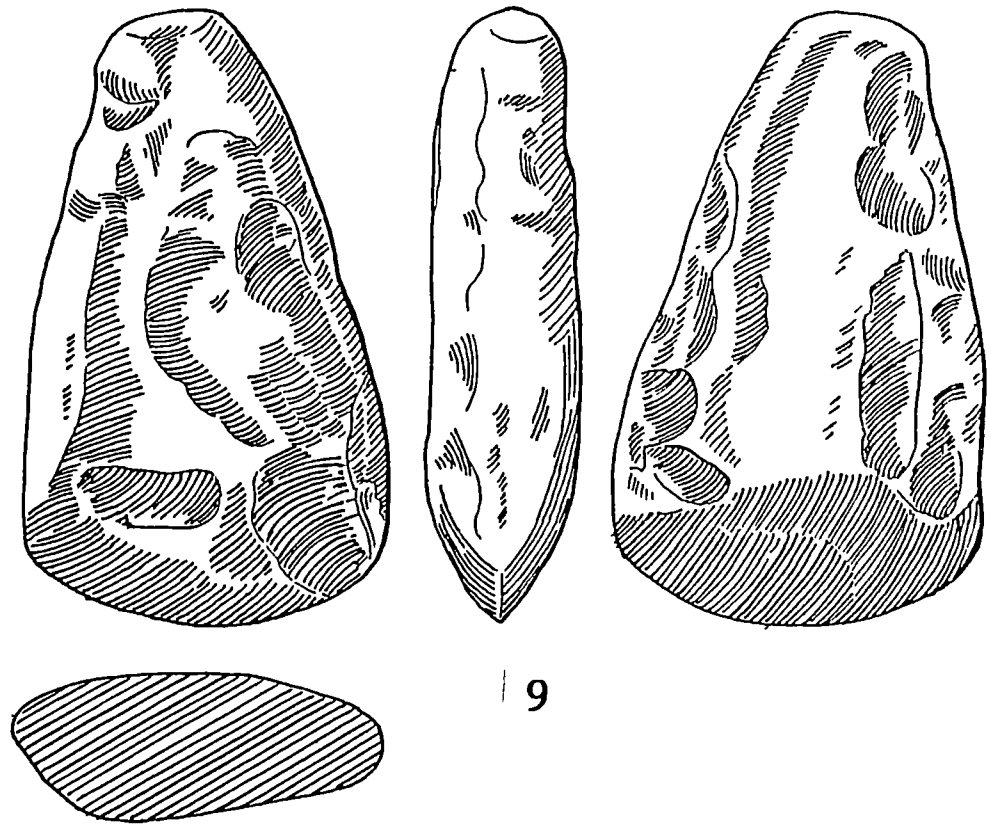

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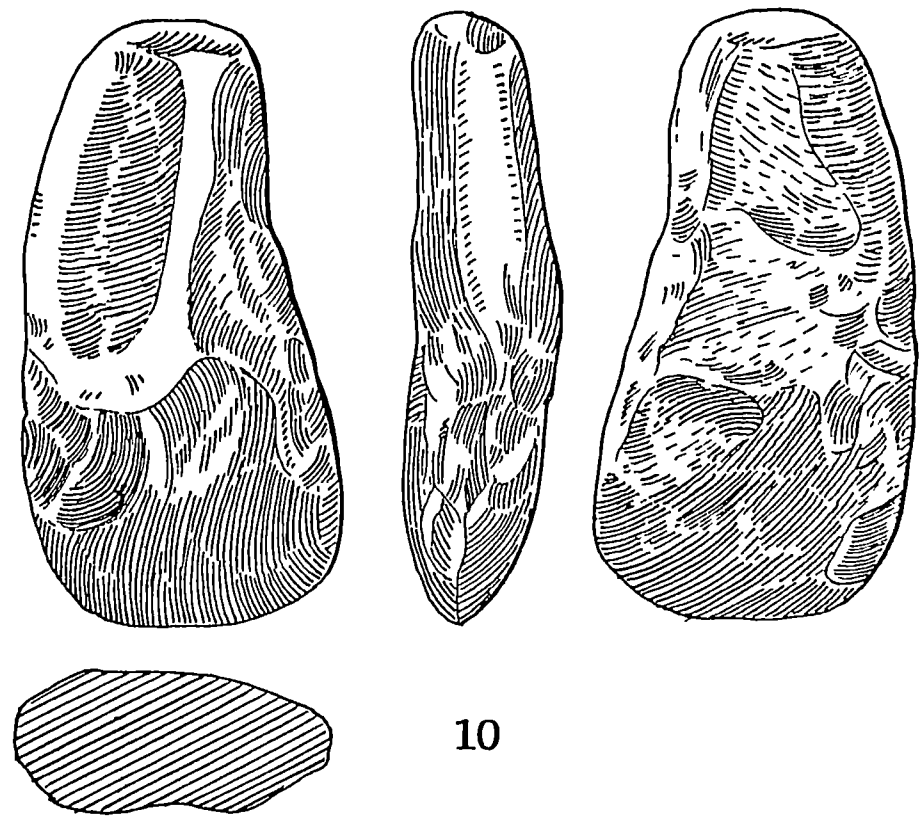

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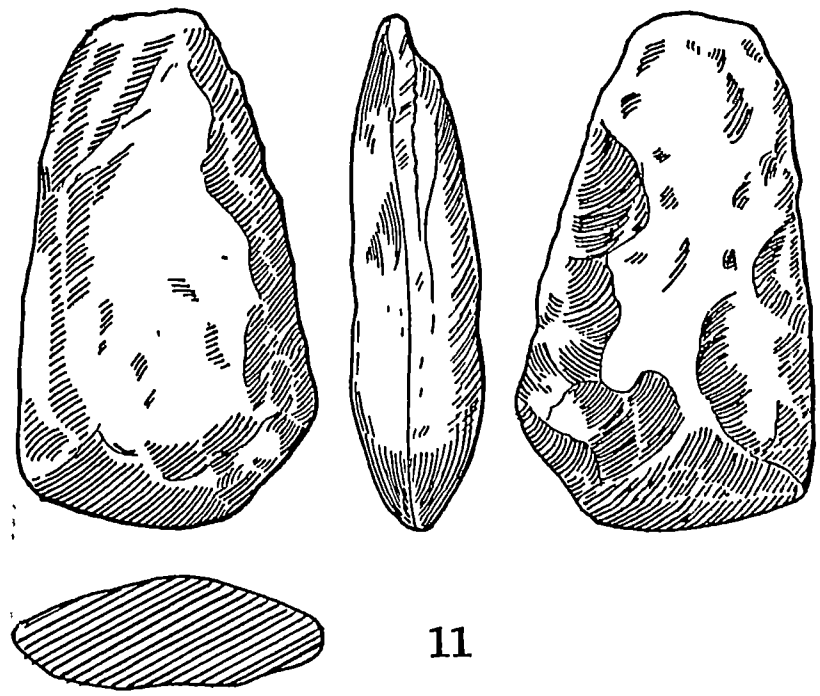

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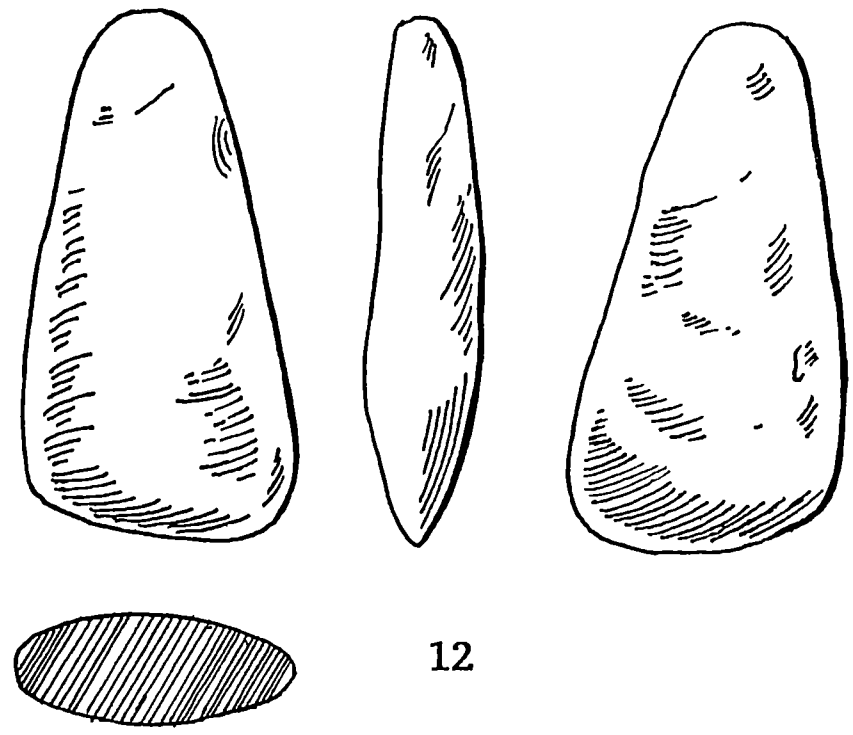

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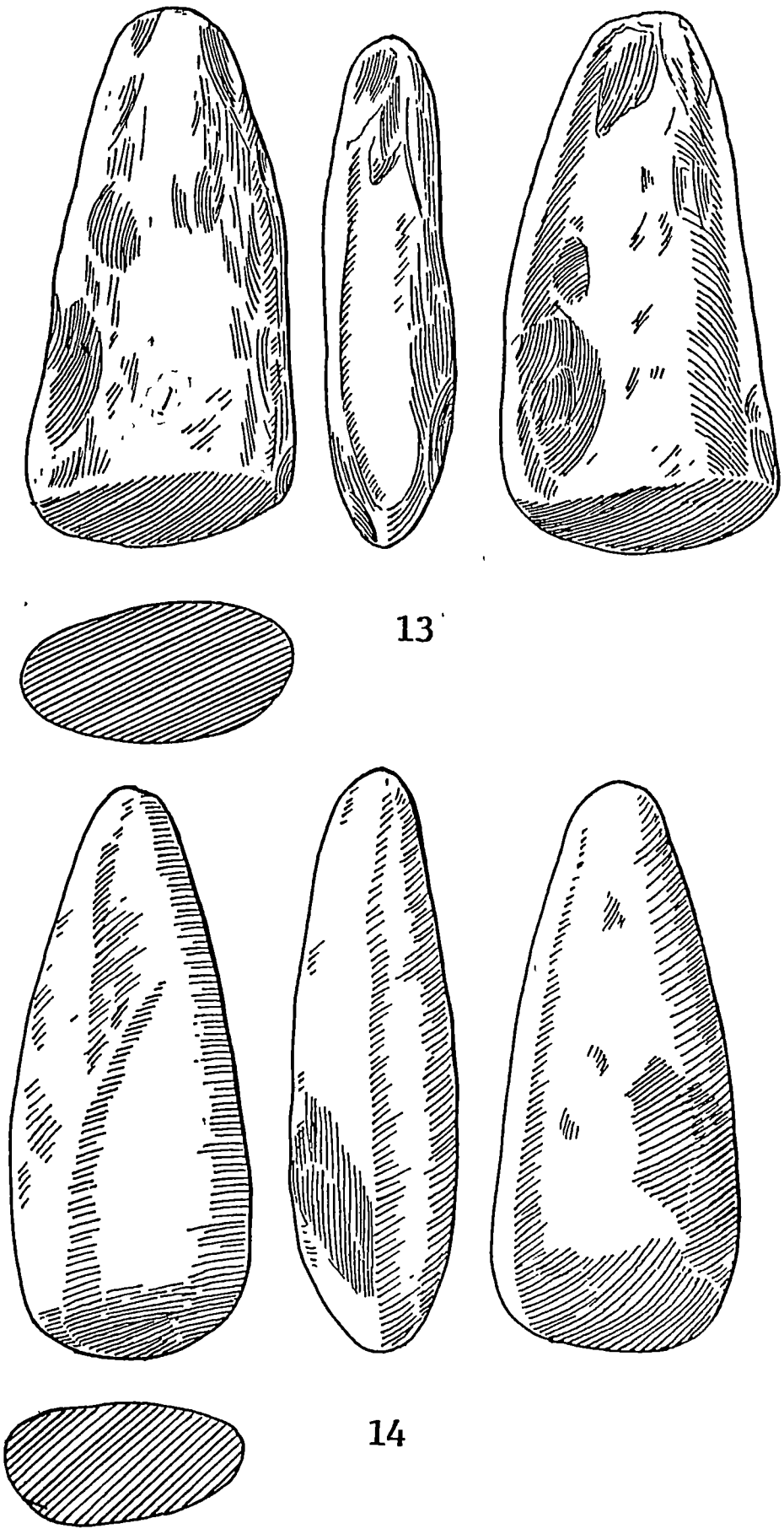

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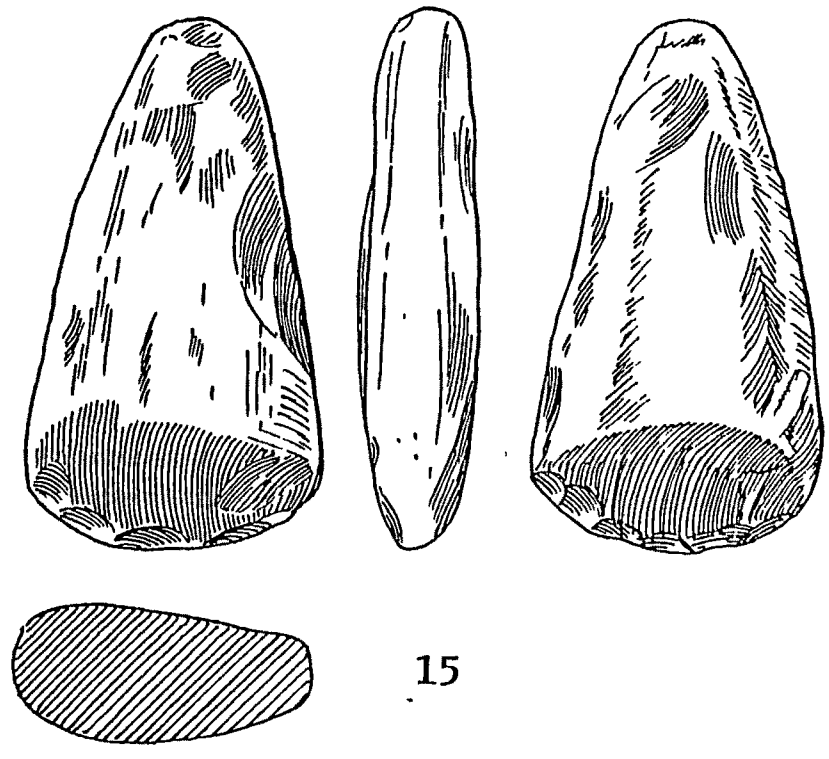

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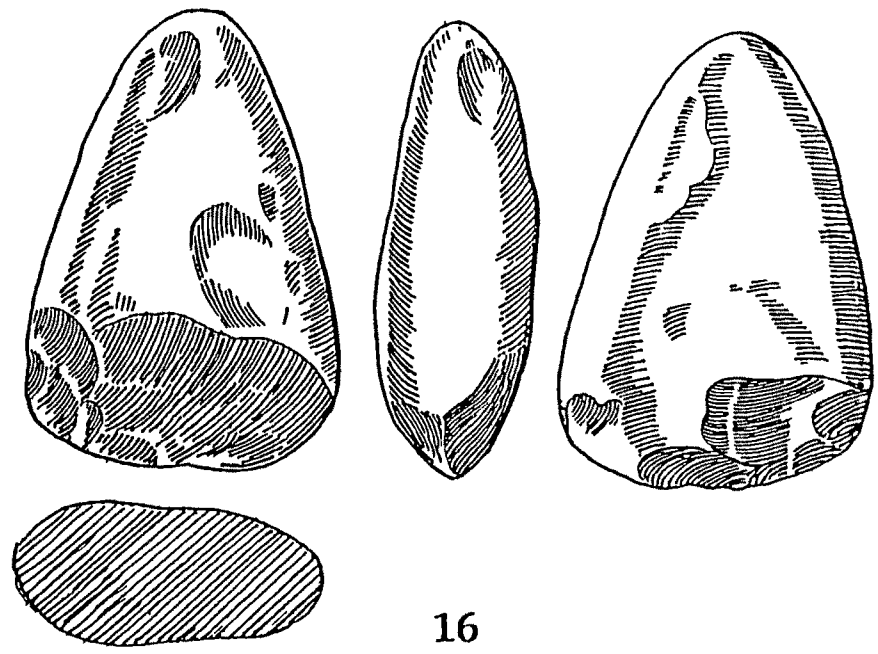

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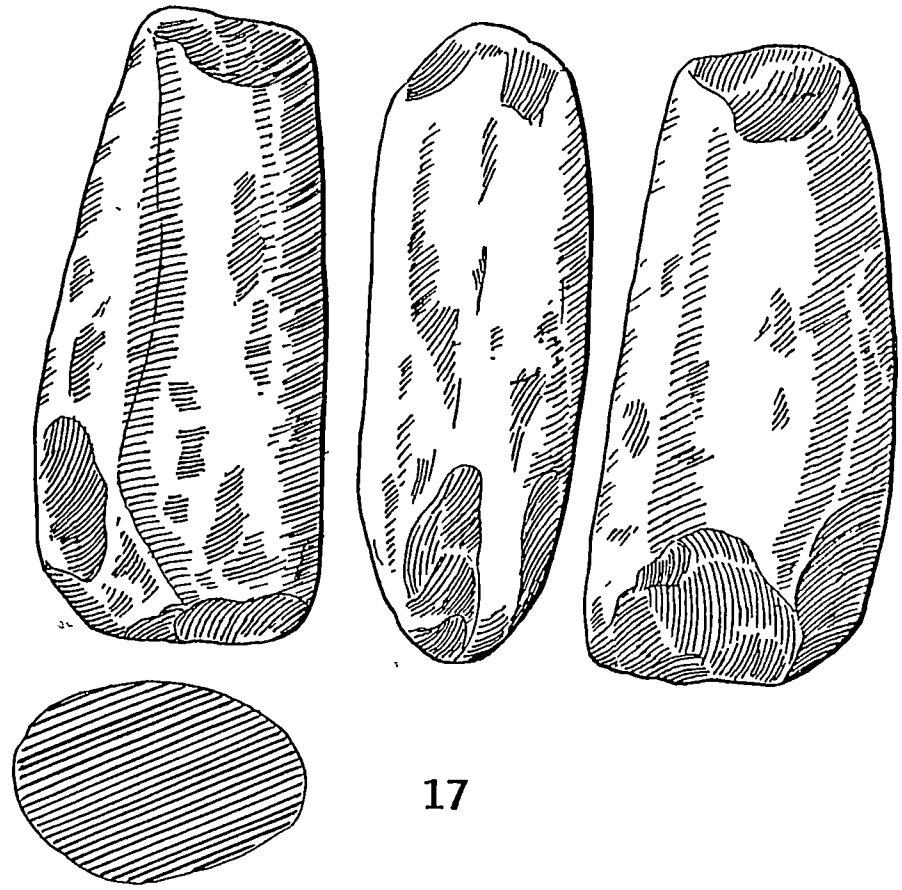

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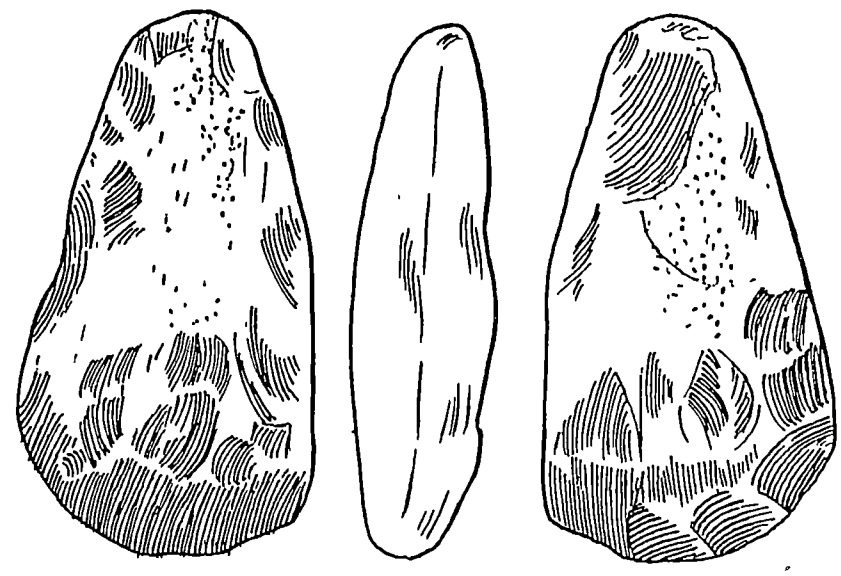

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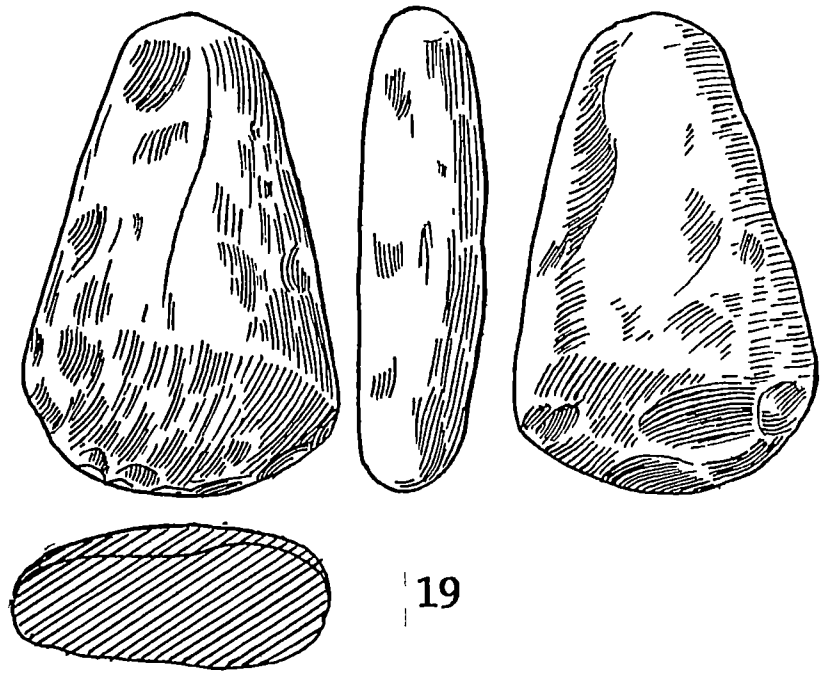

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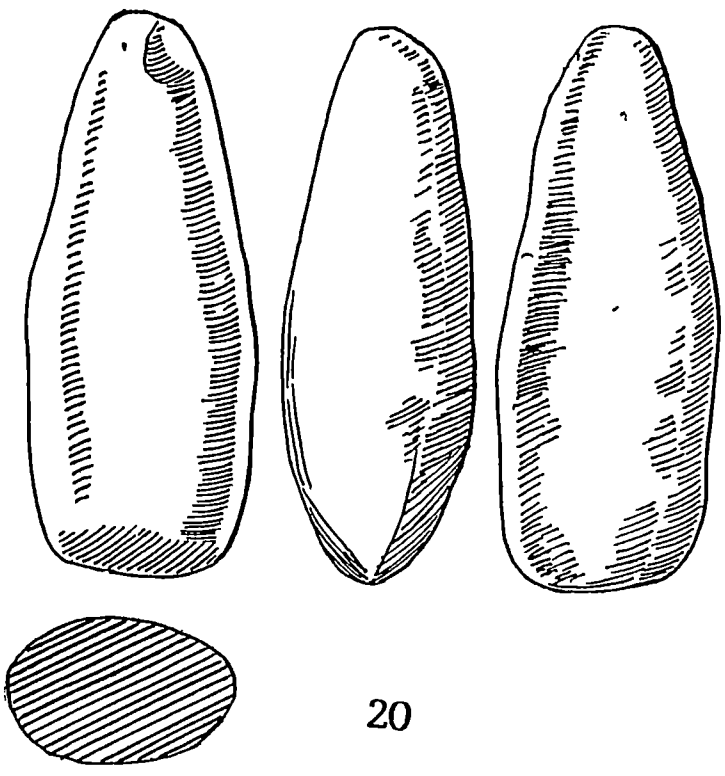

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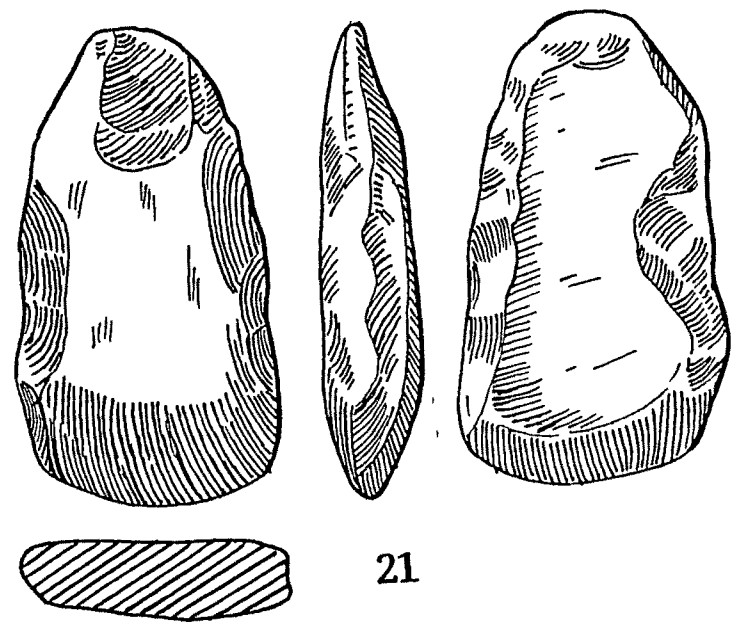

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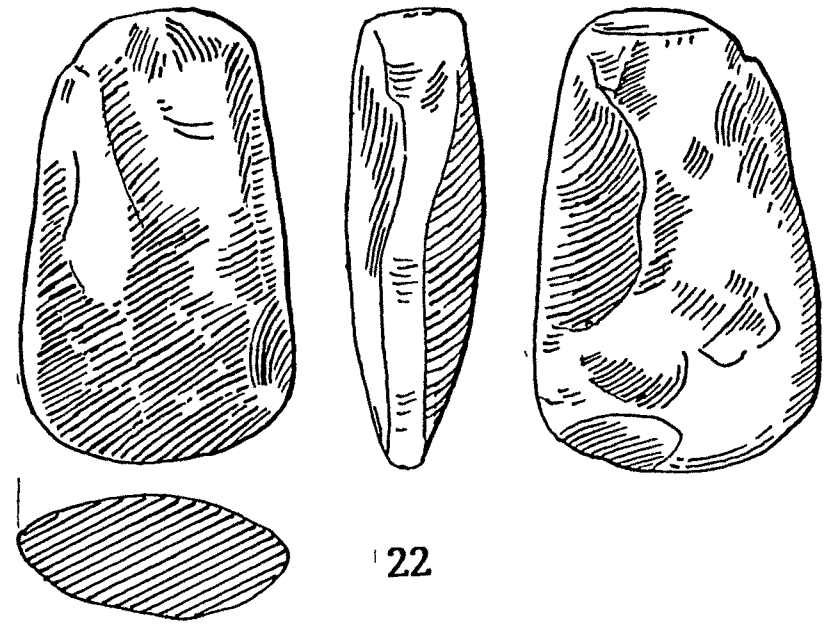

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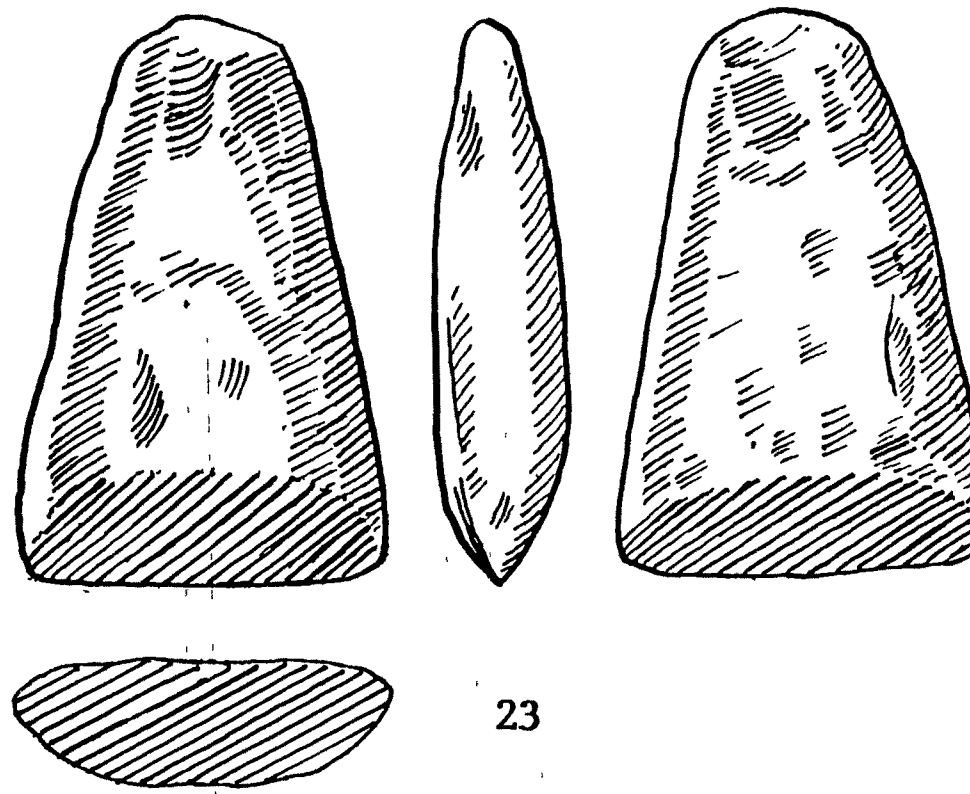

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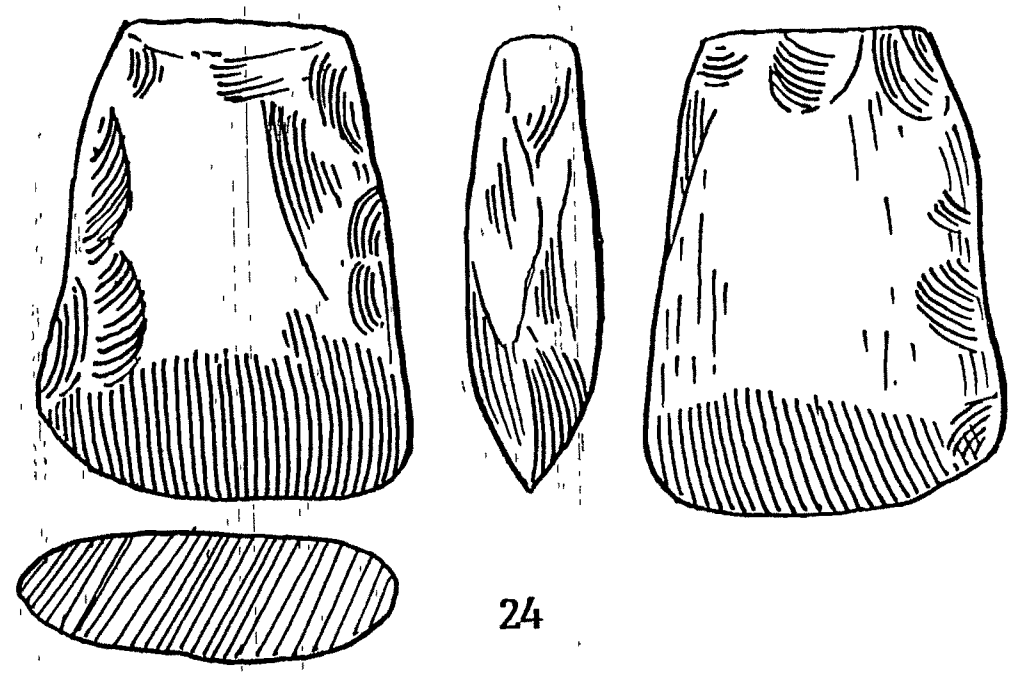

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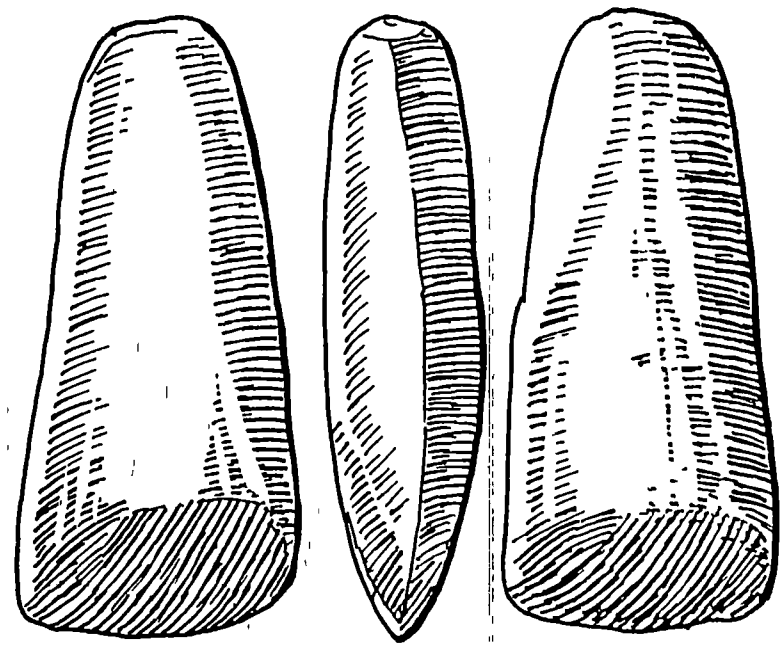

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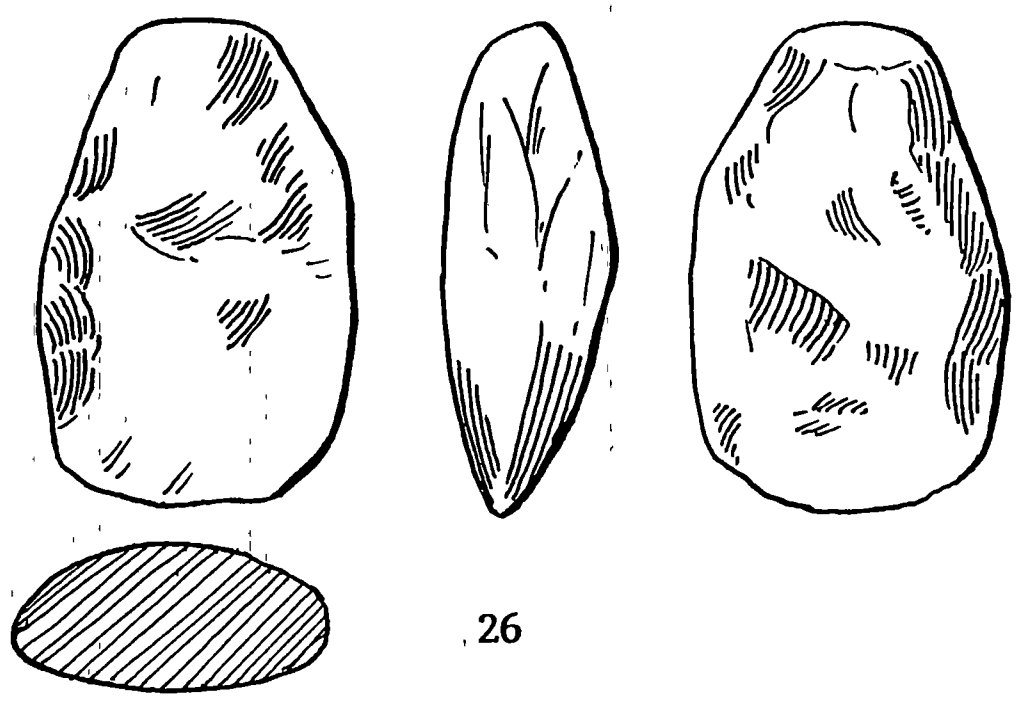

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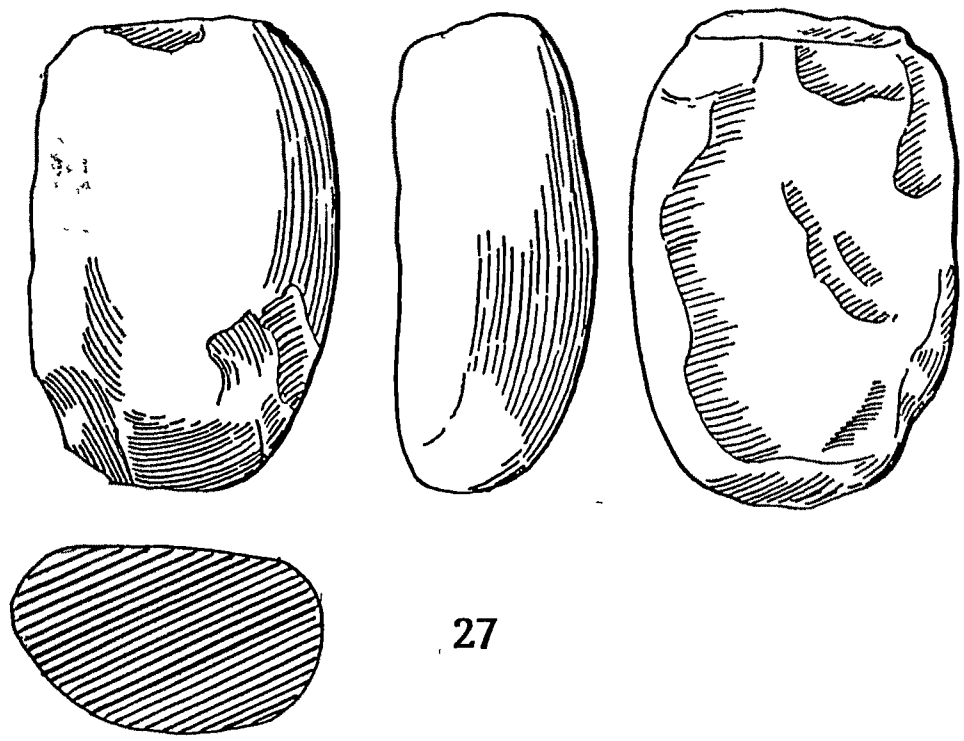

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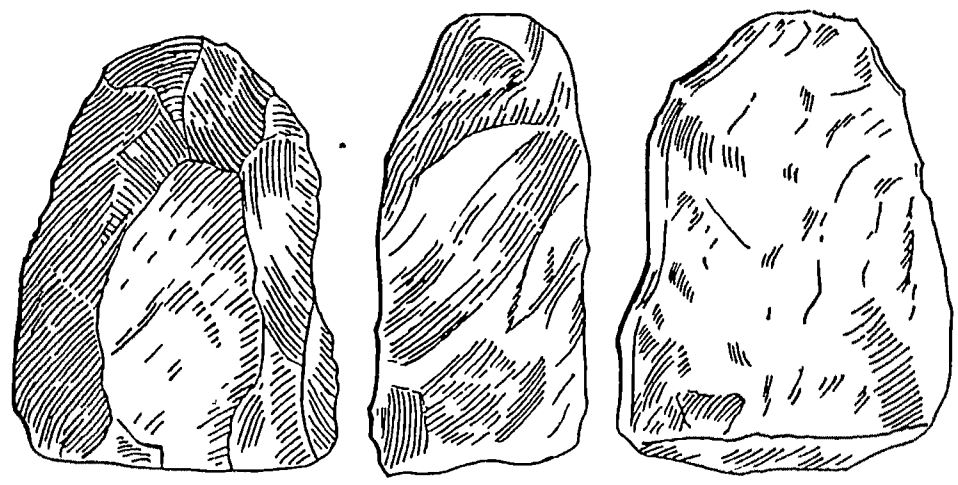

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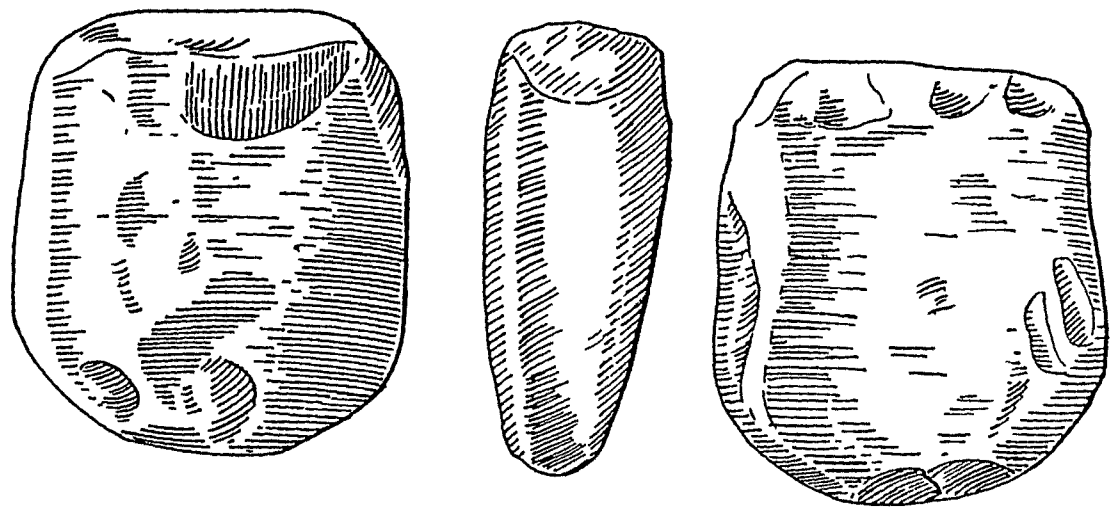

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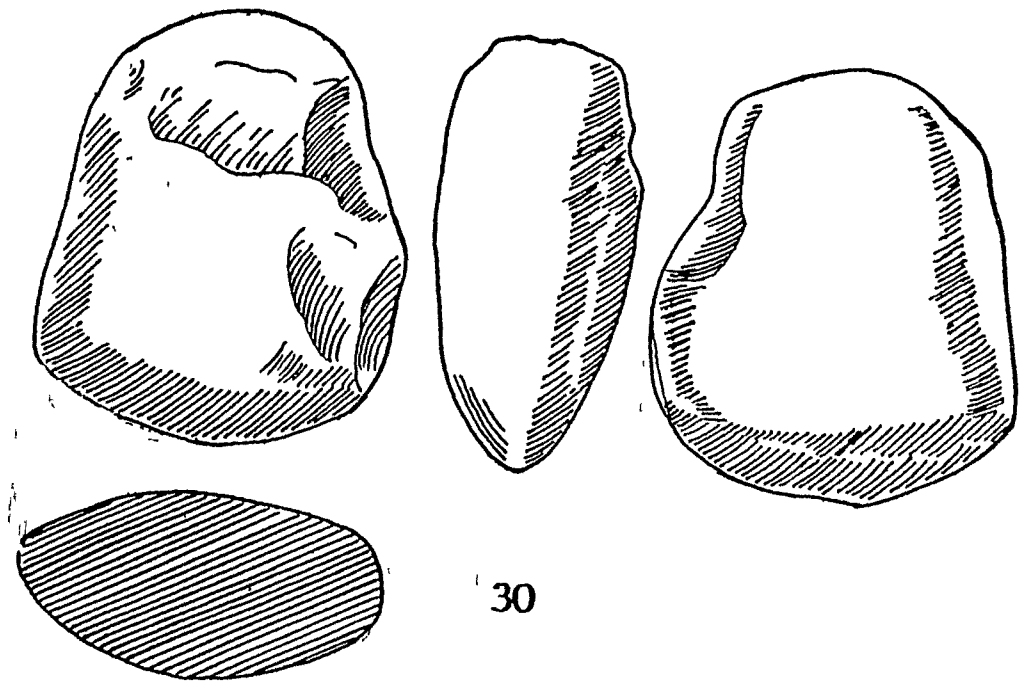

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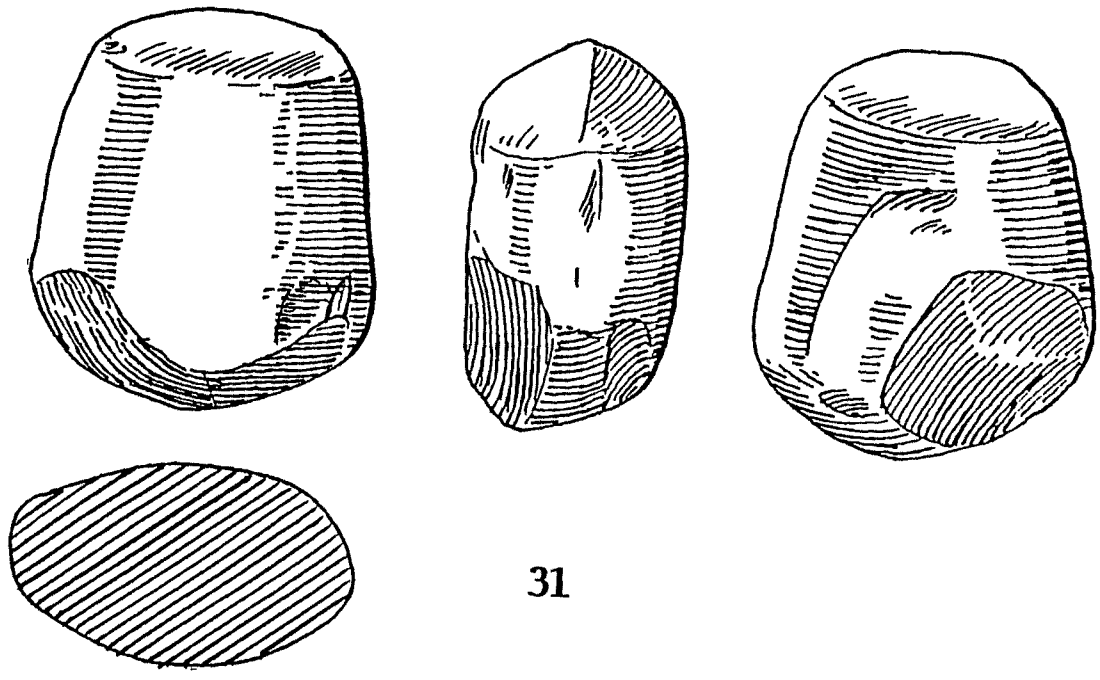

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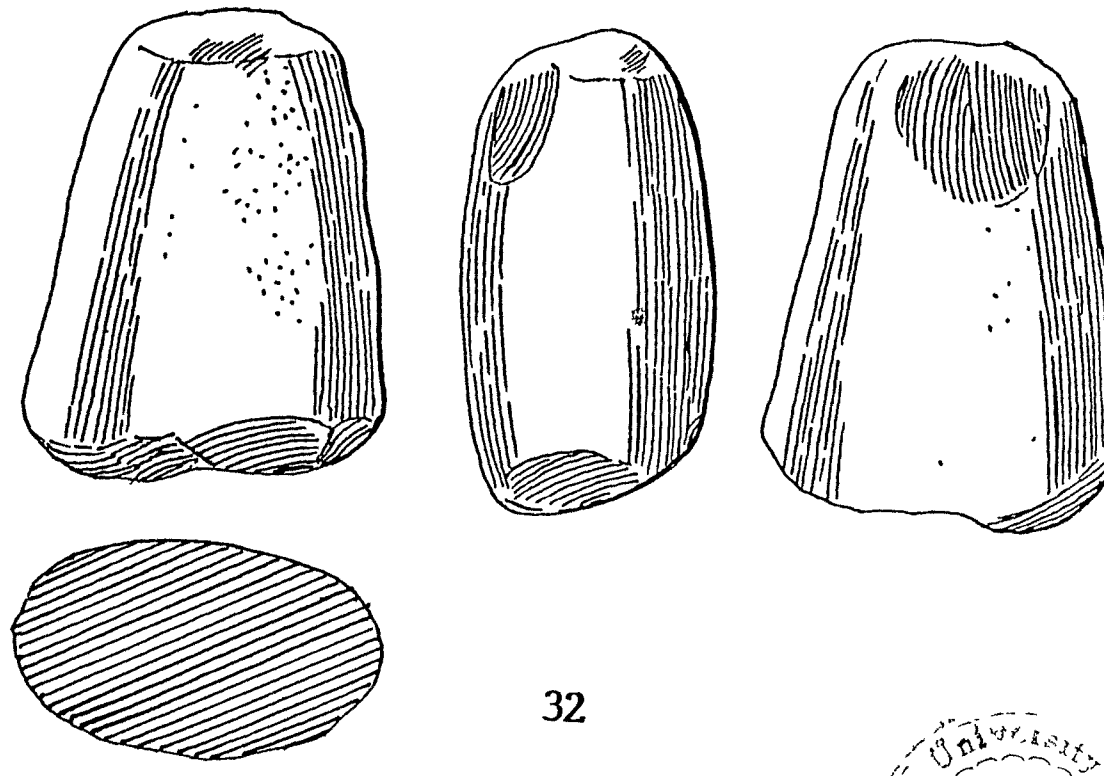

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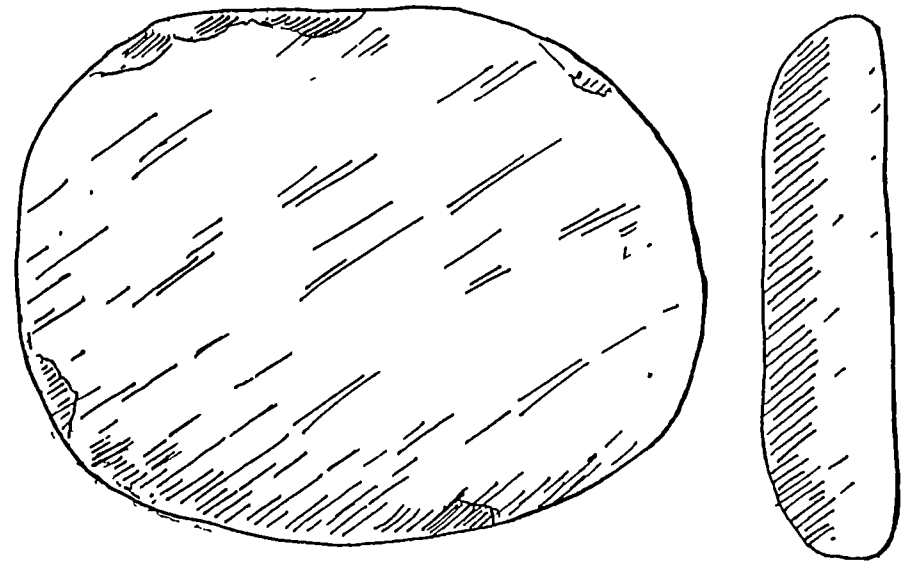

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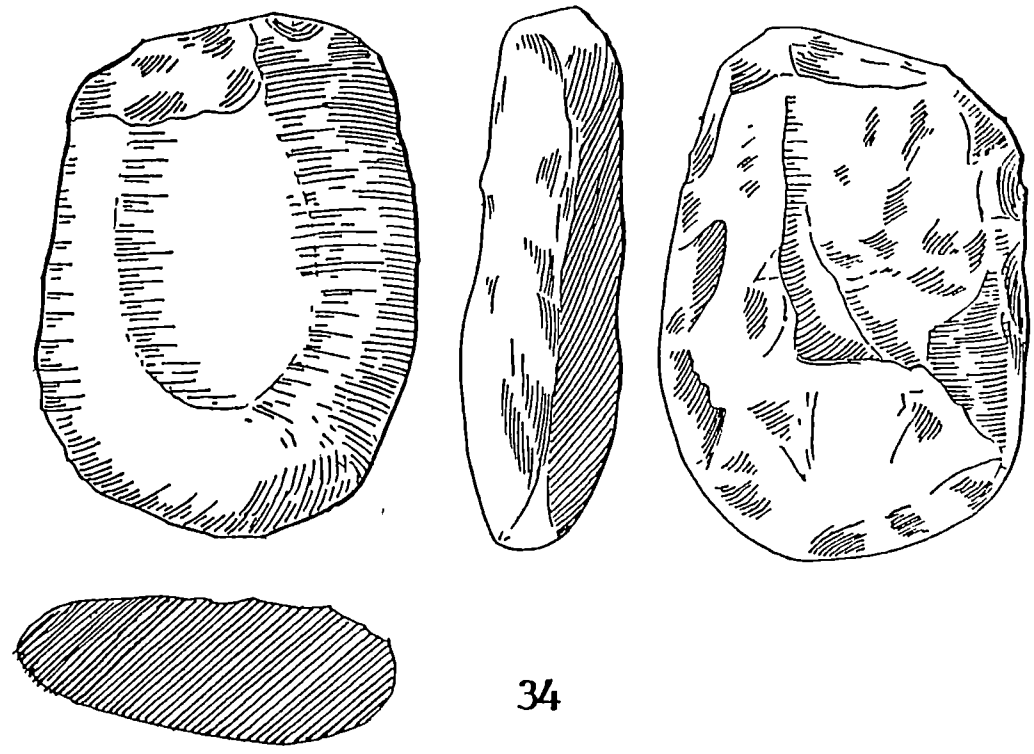

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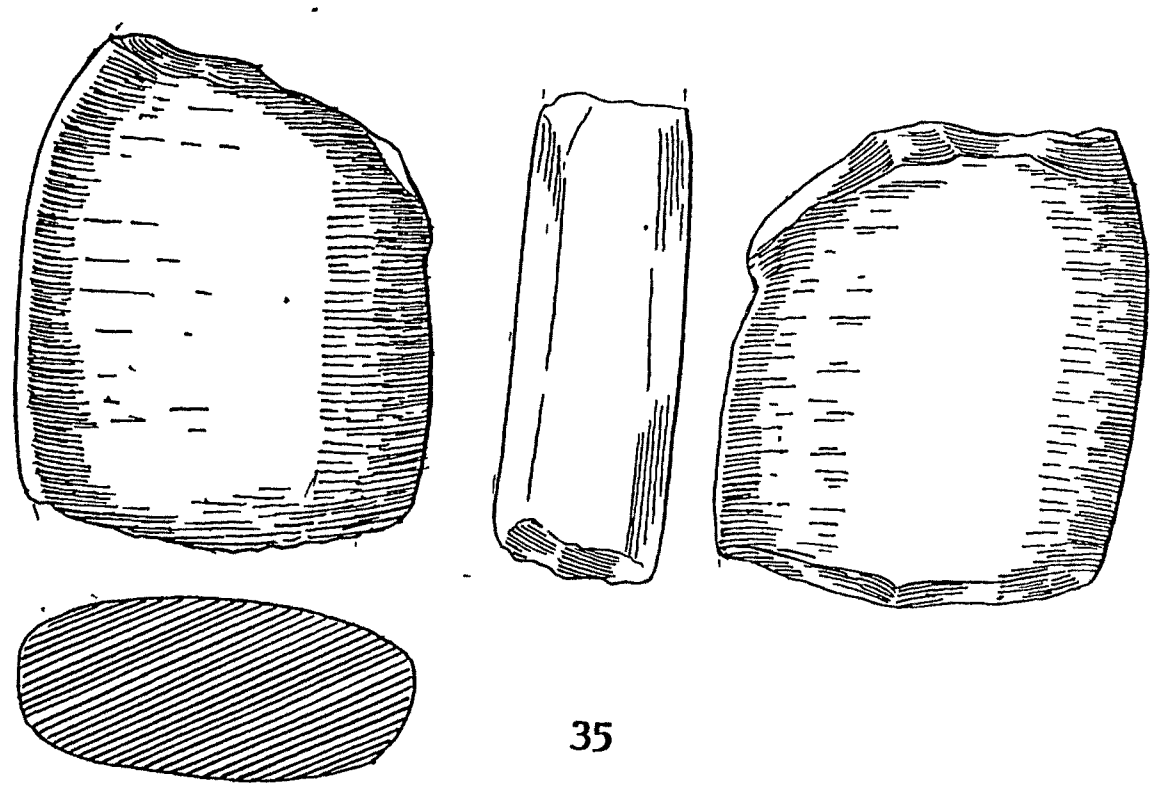

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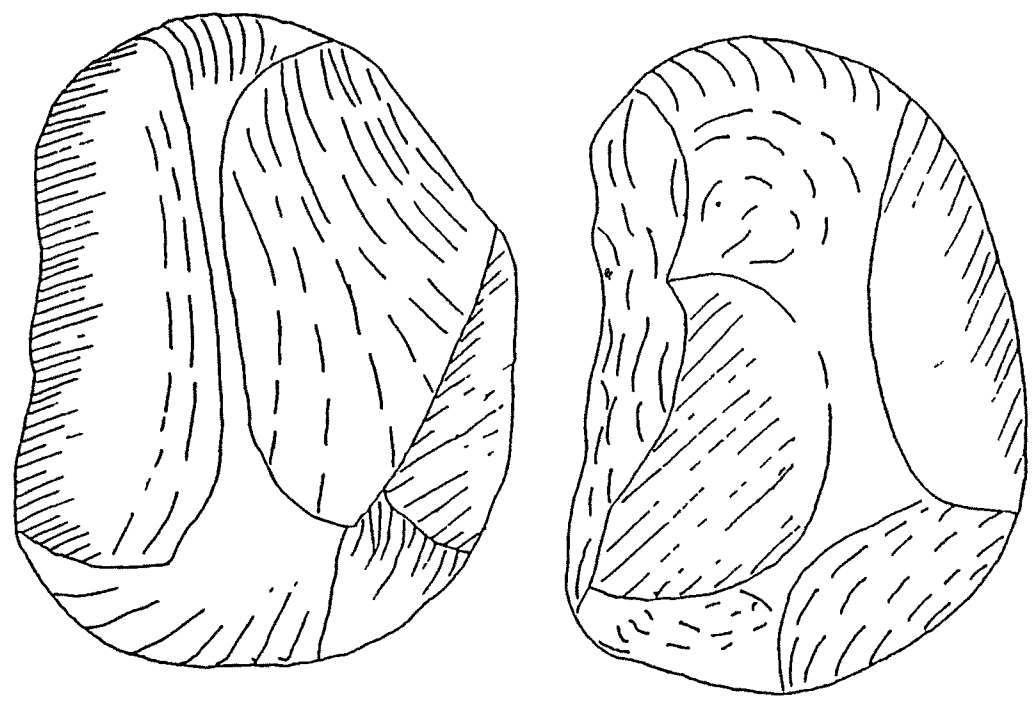
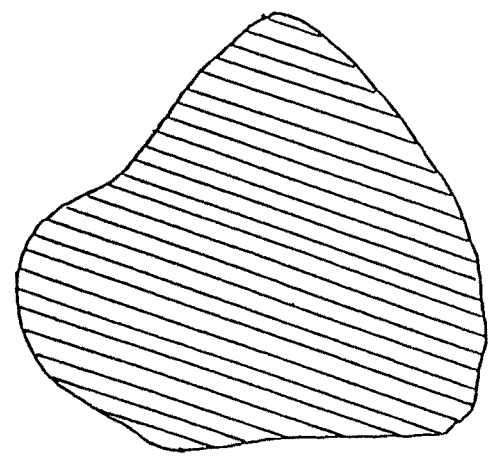
FIG. VII: HAMMER STONE





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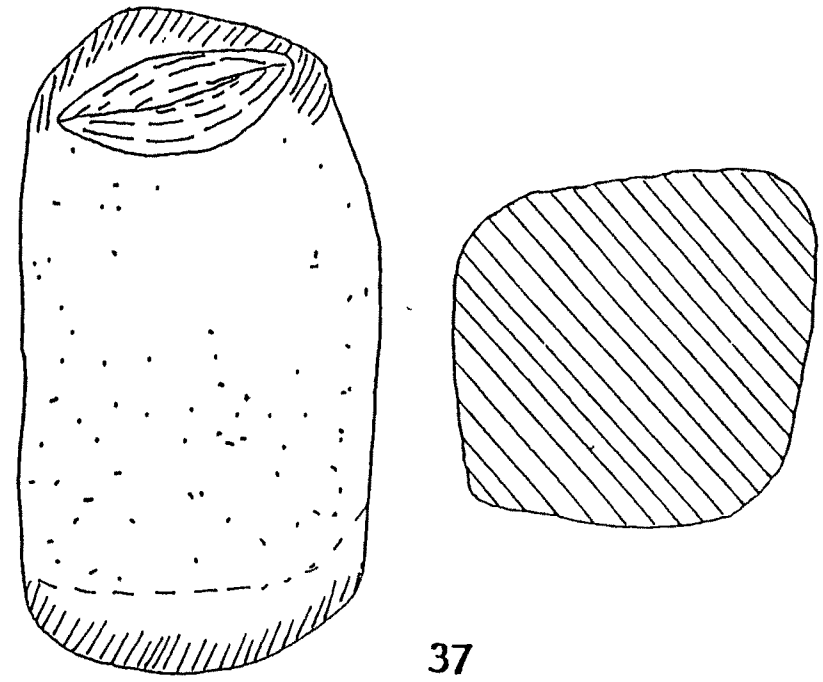

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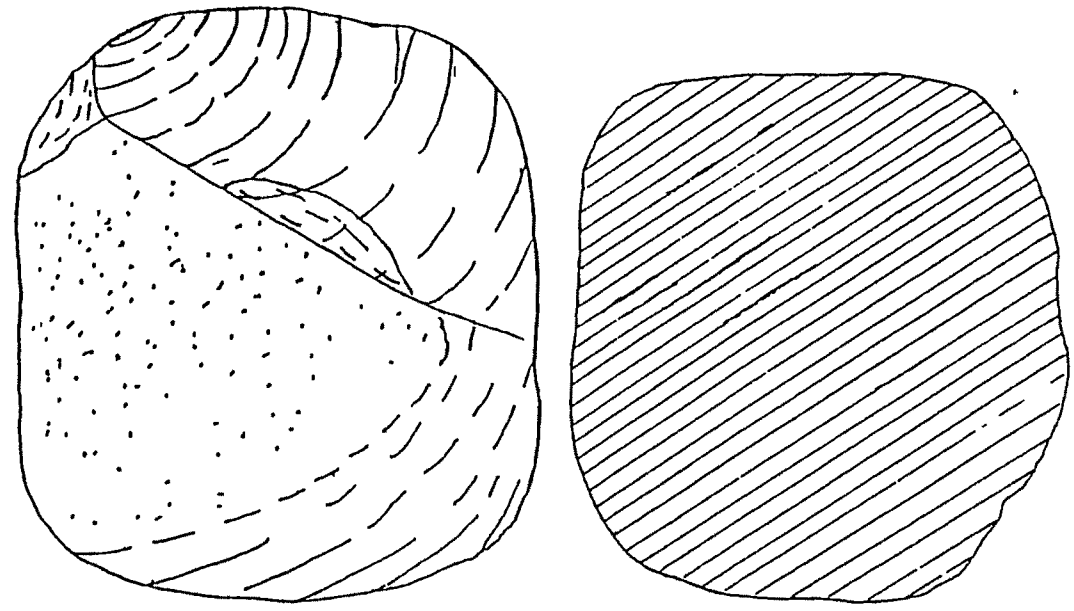

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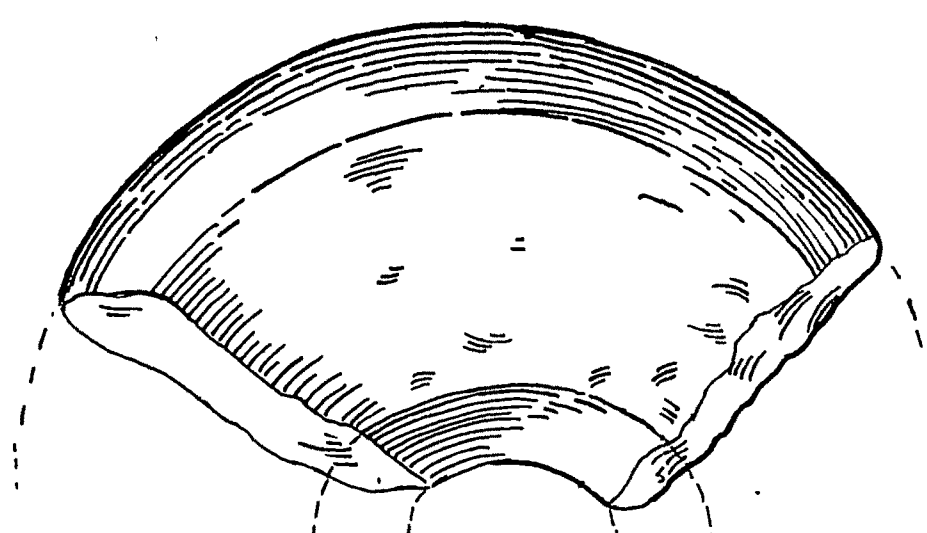
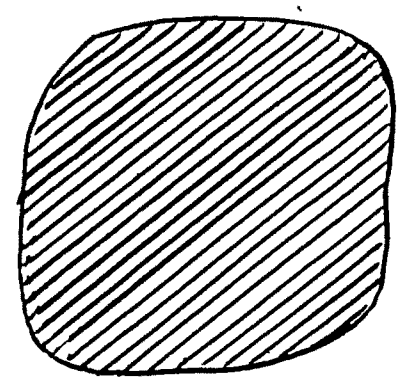
FIG. VIII: RING STONE, SLING BALL AND QUERN





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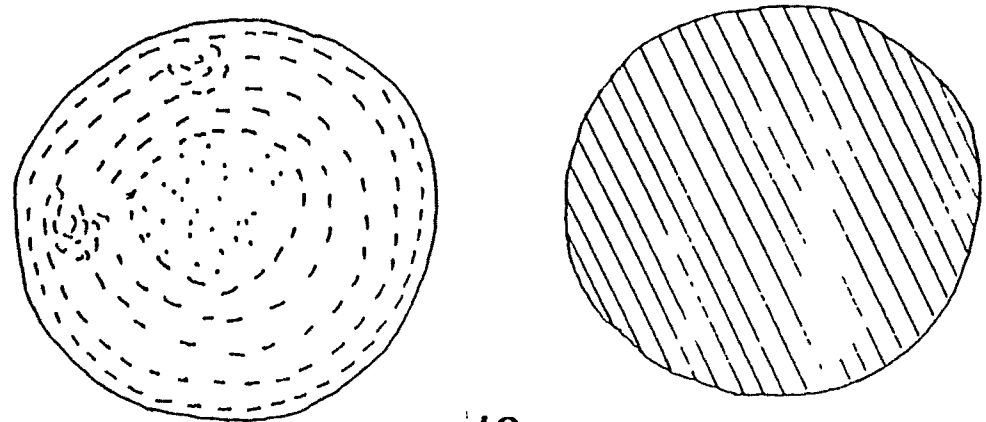

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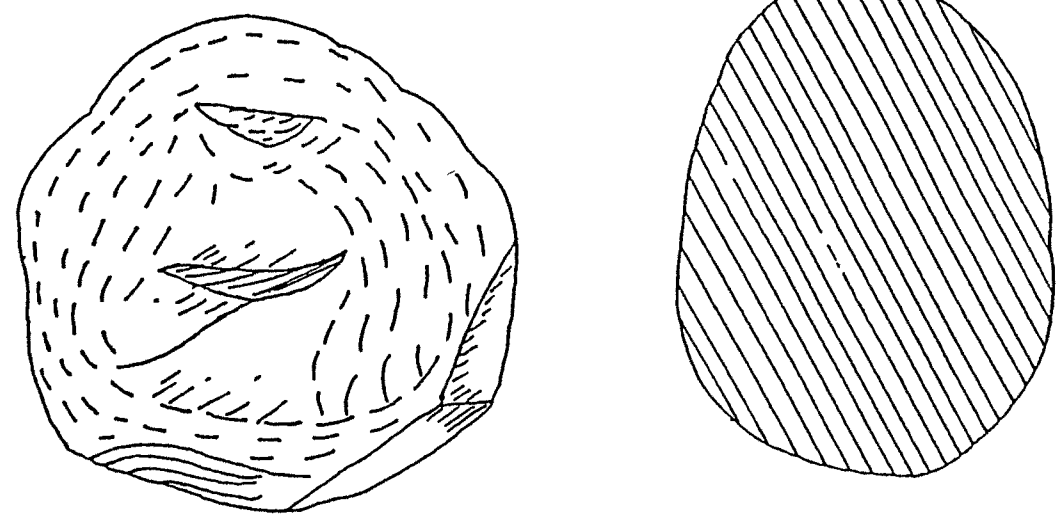

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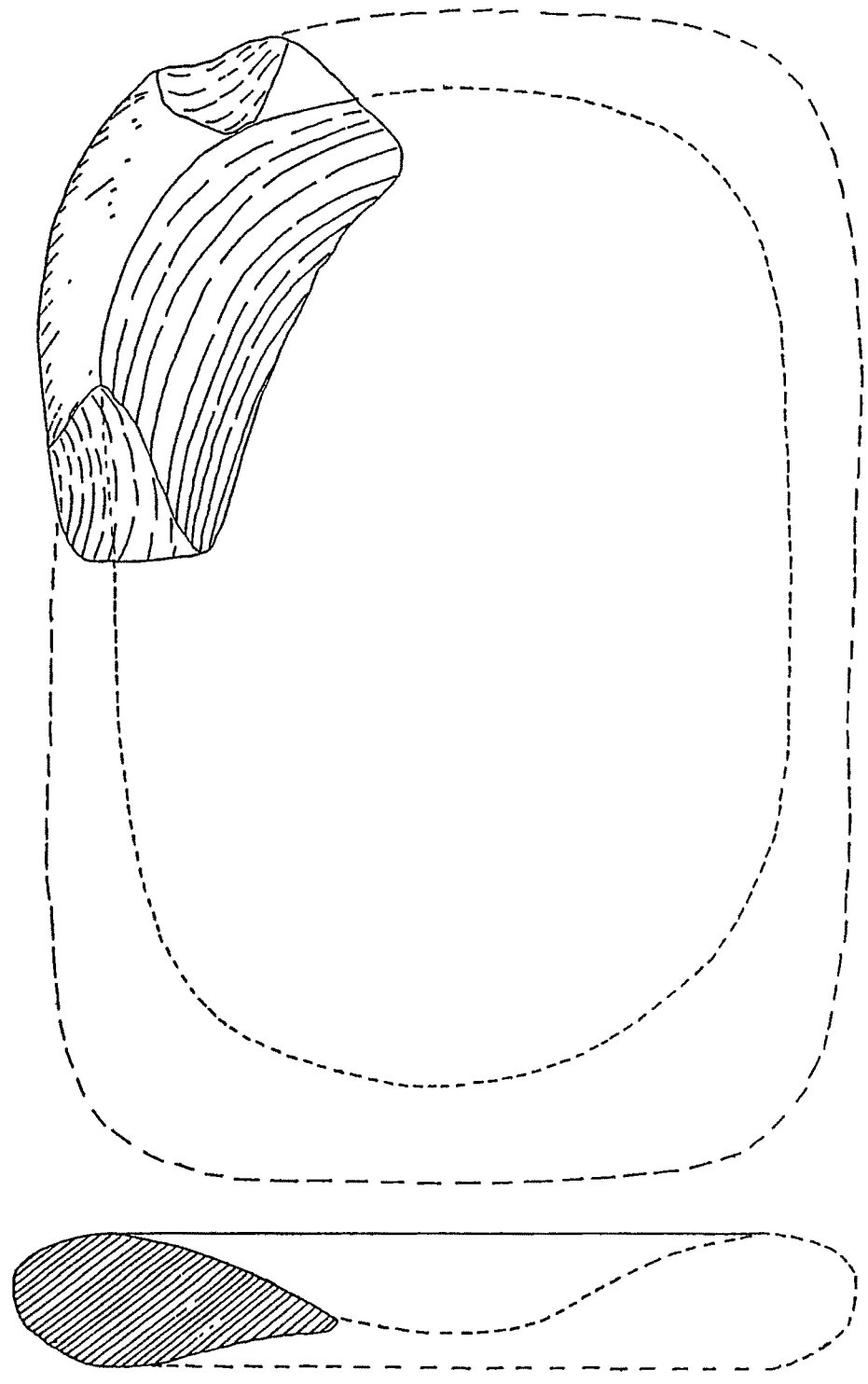

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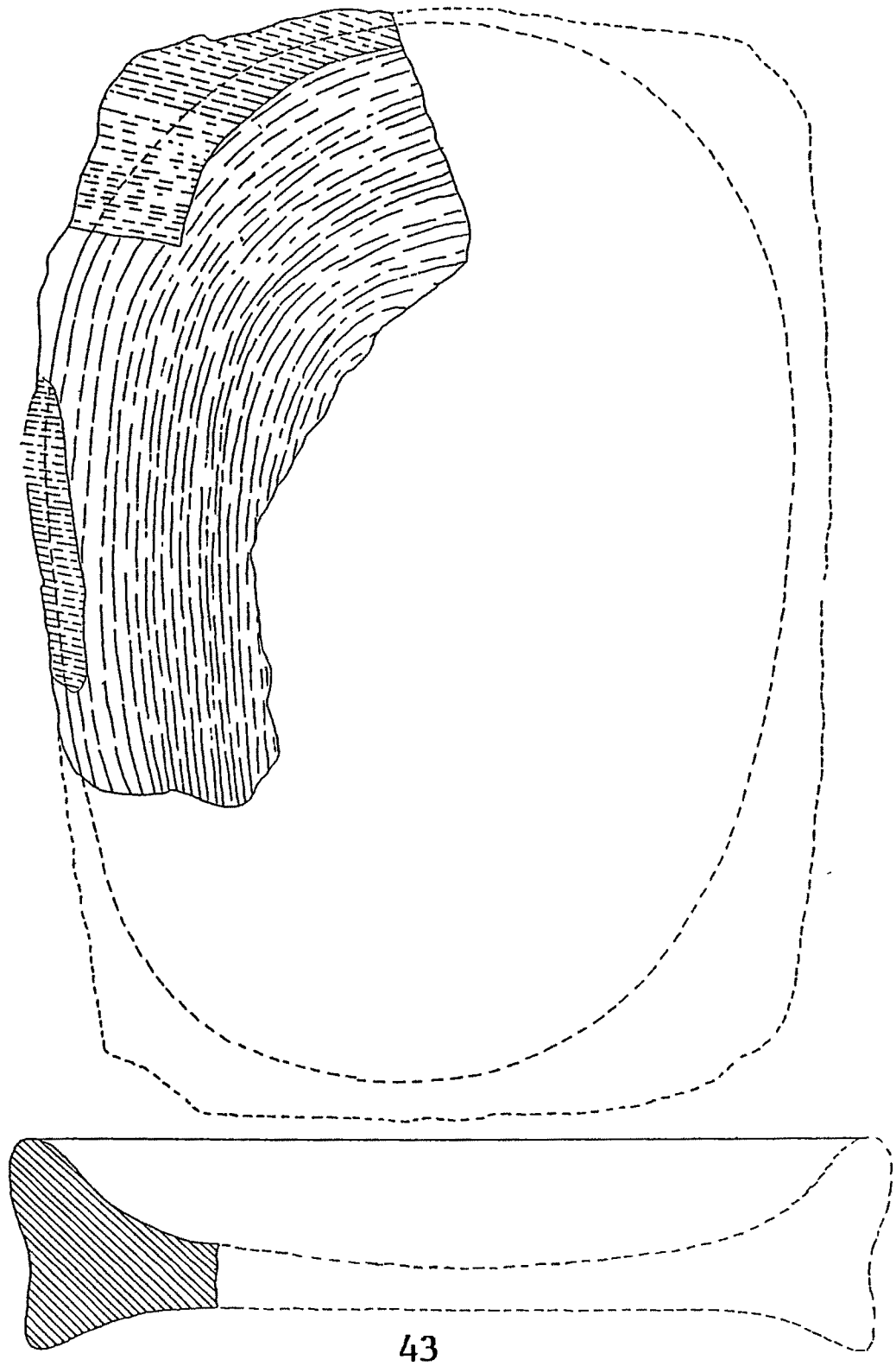

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CHAPTER VII

MEGALITHIC SITES

It is a well known fact that in most parts of India, the Neolithic/Chalcolithic culture was followed by the Iron using Megalithic culture characterised by numerous curious looking burials popularly termed as 'Megaliths'. The nature of these commemmorative monuments were both sepulchral and religious.

History of the study of the Megalithic culture in India goes as far back as to 1823 (Babington) and since then both foreign and indegenous Archaeologists have made detailed study highlighting the various aspects of the culture.

To understand the multifaceted personality of this culture along with its wide spread ramifications across the length and breadth of the country, it is necessary to glance through the evidences available in various regions.

Some glimpses of Megalithic burials in North India were brought to light as far back as in 1871-72 when Carlleyle reported occurrence of cairns at Jagner and at Khera 10 Km west of Fatehpur Sikhri in Uttar Pradesh. Other important sites reported in the region in the 19th century include Mirzapore (Cockburn, J., 1894). Subsequent explorations revealed large number of Megalithic burial sites scattered "near the junction of the northern slope of the Vindhyas and the alluvial of the Ganga valley" (Sharma, G.R., 1980). Occurrence of cairn circles in the Varanasi - Banda region and cists in Mirzapore - Allahabad region is noteworthy. Besides this, cists within cairns, urn burials and menhirs are the other types reported from the region. Excavations of Meglithic tombs in the Chandraprabha valley, district Varanasi, has yielded grave furnitures comprising Black and Red ware, Black slipped ware and Red ware, terracotta beads, gold bangles,

microliths and skeletal remains generally of bovids. These are found kept on sand cushion provided at the floor level of the pits. This cists are smaller in size compared to South Indian types. Chronologically the three Megalithic groups in the Vindhyan region have been placed between 800 B.C. and 300 B.C. (Sharma, 1985). Excavation of menhirs at Burzahom (IAR, 1960-61, 1961-62) another important site in the northern group revealed occupational deposits (Period III) having Red ware pottery, Black burnished ware and few polished stone axes and bone tools.

The north-eastern group of Megalithic sites are commonly represented by menhirs and dolmens. The earliest of these were reported from Jamguri and Dimapur in Assam region (Hutton, 1923). More number of sites have come to light in the recent past through some systematic exploration in Churchandpur and Ukhrul districts of Manipur (IAR, 1983-84). Erecting Megaliths is a living tradition in the north-eastern region even now. It is prevalent among the Khasis in Assam (Heimendorf, 1945) and exists among the Mao-Nagas of Manipur (Singh, O.K., 1985). No C-14 dates however have been assigned to Megalithic culture of this region.

Similarly, in the eastern region, Megalithic sites were first noticed in the Chotanagpur (Dalton, E.T., 1873) and in the Ranchi region (Roy, S.C., 1915) in Bihar. Haimendorf's (1943) work on Megalithism among the Orissan tribals is noteworthy. After a gap of about 40 years, further exploration in the Upper Brahmani valley in the Sundargarh district of Orissa (IAR, 1983-84) has brought to light Megalithic sites. The eastern Megalithic sites are mostly represented by cairn and stone circles. Since none of these sites are subjected to excavation, information pertaining to various other aspects of the culture is wanting.

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Only few sites having stone circles have come to light in the Rajasthan and Gujarat area of Western India (Deo, 1985). Due to limited work, detailed infomation about Megalithic culture in this region is lacking. However, the excavation of Cementry located to the north-west of the habitation site at Surkotada, a Harappan site in the Kutch region, revealing an oval pit containing pots and covered by a massive stone slab or capstone is significant for, this practice is "unusaul and unprecedented" in the region (Joshi, J.P., 1972).

The central Indian region has been brought under the Megalithic cultural map of India due to the efforts of individual Archaeologists as well academic institutions. Although Beglar, an assistant of A. Cunningham reported occurrence of "upright stones" and stretch of "broken blocks of stone" in Sorara village in the central provinces as early as in 1873-74, this was never taken seriously. (Cunningham, 1873-74). Obviosuly, he was referring to Menhirs and cairns. Later in 1933-34 (ASI AR 1930-34) again these sites were re-examined and interpreted as "large areas of stone age cemetry". Later works however confirmed the evidence of Megalithic monuments in the eastern and southern part of Madhya Pradesh, particularly in the Raipur, Durg and Bastar districts. The three types commonly found in these sites comprise of cairn stone circles, dolmens and menhirs (Gupta, C.S., 1982). In 1956-57, excavation conducted at Dhanora in Raipur district (Dikshit, M.G.) revealed not only the mode of construction of Megaliths but also skeletal remains, beads and glass bangles. Copper vessel is another interesting evidence. Excavation of Malhar revealed Megalithic cultural remains below Chalcolithic in the region (Gupta, C.S., 1982). However, more study is required to understand the various other aspects of the culture and its exact chronological position. It is also interesting to note that till recently, some of the tribals of Bastar district, namely Murias and Marias Gonds practised Megalithism (Sharma, 1985).

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Comparatively Megalithic culture in the Deccan has been studied well particularly in the Vidarbha region. An interesting feature of the Deccan Megalithic culture is that habitation sites and burials exist side by side as for example, at Takalghat (Deo, S.B., 1970) and Naikund (IAR, 1977-78). Burial types are mainly represented by stone circles. Recently, some circles enclosing chambers and cists have also come to limelight (IAR, 1982-83; 1984-85). Besides the above, most important sites reported in the Deccan include Kaundinyapura in Amaravati district (Dikshit, 1956), Junapani (IAR, 1960-61), Takalghat and Khapa (Deo, 1970), Mahur Jhari (Deo, 1970-71), Bhagi Mohari (IAR, 1982-83) and Raipur (IAR, 1984-85) in Nagpur district; Paunar Khairwada (IAR, 1981-82) in Vardha district and sites in Chanda district (IAR, 1960-61), Ranjala in Dhulia district (IAR, 1960-61) are noteworthy. Of these, as early as in 1879, Junapani was subjected to small scale excavation by Rivet-Carnac.

Curiously, the Deccan Megalithic culture co-mingled with the preceding Chalcolithic culture unlike southern Megalithic complex which succeeded Chalcolithic stage of the Neolithic culture (Sundara, 1975). This cultural co-mingling indicated by pottery tradition was brought to light in the excavation at Tekwada, equated chronologically with Bahal 1B, where Megalithic burials as well as Jorwe ware occur together. Earlier excavation conducted at Kaundinyapura (Dikshit, 1956-57) a new cultural aspect came to light represented by Black and Red pottery devoid of variation in shapes, Micacious Red ware, painted Black on Red ware, different than the Chalcolithic painted ware and etched carnelian beads typical of the southern Megalithic complex. These evidences created a void in understanding the personality of this new culture. However, the excavation of Megalithic stone circles at Junapani (IAR, 1961-62) bridged the gap as evidenced by the presence of similar ceramic types encountered in the lowest habitational level at Kaundinyapura. The other grave goods at Junapani comprising of iron spearheads, swords, spikes, etc., have also been reported from

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finials having decorated lids have also been reported from Raipur (IAR, 1984-85). Chronologically the Megalithic culture which seems to have succeeded Chalcolithic culture of Deccan is assigned to 700 to 600 B.C. if not earlier (Deo, 1985).

As is well known, South India has the largest concentration of Megalithic sites in India with varied types. In the long history of research since Babington's (1823) first work, a host of both foreign and indegenous scholars have contributed their thought till recently and significant advance has been made by them in understanding the authors of Megaliths, their origin, material culture, racial types and numerous other factors.

The work of Breeks (1837) and his attempt to co-relate the Megalithism to the customs of tribes of Nilagiris, Meadows Taylor's obsrvation on Megaliths of 'Dekhan' (1863), Cole's work on Coorg Megaliths (1868), and the comprehensive account of Megaliths in India including South by Fergusson (1872) are some of the most outstanding works of the time. The works of Newbold (1852), Mackenzie J.S.F.(1873), Burgess (1874), Boswell (1872), Jagor (1876), Caldwell (1877) and Branfill (1881) in various parts of South India also deserve special mention. Sewell (1882), Robert Bruce Foote (1916) and Das Gupta (1930) have shed light on various facets of Megalithic culture in the form of catalogues of sites and have given descriptive notes on antiquities. Ramachandran's 'Bibliography on Indian Megaliths' (1970) is an important compilation of gist of articles/reports on exploration and excavation of Megalithic sites since 1823 till the date of its compliation.

In the beginning of 20th century, Alexander Rea (1903-1904) brought out remarkable evidence about material culture of Megalithic builders in Tamilnadu by excavating couple of burials at Adichannalur. He excavated Perumbiar in Chingelput district (1907-1908) and published

Kaundinyapura. Excavations at Paunar (Dhavlikar-Deo, 1967) further corroborated this cultural co-mingling. The overall personality of Vidarbha Megalithic culture and the relation between the habitation and the burial sites was finally ascertained by excavating Takalghat and Khapa sites respectively (Deo, 1970). Here, habitations throw more light on the settlement pattern. Houses were made of mud walls and reeds. Floors were made up of brown compact clay mixed with kankar and dressed with lime and rammed. Ceramic traditions reported from the above sites also occur here besides the Carnelian beads of southern type. In the burials, represented by stone circles all typical iron objects have been reported along with rectangular axes and the body equipped with cross-band ring-fasteners commonly encountered in the southern Megaliths. However, the most interesting evidence found in the burials viz., the "Copper ornament for the face of a horse found over the remains of horse skeleton" is noteworthy and unique in the Indian Megalithic culture. Hilted iron dagger reported from Mahurjhari is another noteworthy feature. The ceramics of Deccan Megaliths are usually represented by Black and Red ware, Micacious Red ware and Red ware, the last two with or without paintings. A remarkable difference between the habitation and burials in the region is, while the painted ceramic tradition is prevalent in the former, the latter is devoid of the same.

Cultural affinity between the southern and the Deccan sites are attested by the ocurrence of similar burial types also. Thus, the excavation at Bhagi Mohari revealed stone circles with passage chambers (IAR, 1982-83) and in Roypur, stone circles enclose cists (IAR, 1984-85). Both these types have been reported from the adjacent Andhra/Karnataka region. The cultural interaction between the South and Vidarbha region is further evidenced by the occurrence of copper lids of dishes with birds, viz., Mahurjhari, Takalghat, etc., similar to the ones reported from Adichannallur (Rea, 1902-1903). Recently,

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a catalogue of antiquities from both excavations (1915). Scholarly contribution of Longhurst (1912-15), Hunt (1916-24), Yazdani (1941), Krishna, M.H. (1929-44) and Aiyyappan (1941) throw a flood of light on various aspects of Megalithic culture in southern region.

It is only in the post independence era that more systematic studies were adopted in South India particularly after Wheeler's (1947) excavation at Brahmagiri where for the first time he attempted to put the Megalithic culture within a firm chronological bracket. This revolutionary attempt inspired many a scholars and a series of excavations were taken up in South India. Porkalam (Thapar, 1948) is one such attempt. During this time, considering the need to systematise the nomenclatures of various forms of Megaliths, Krishnaswami (1949) made a sincere attempt to describe them typologically. From 1960 onwards, a large number of sites have been reported in various parts of South India and their features have been described by the scholars who discovered them. The works of Srinivasan (1939 to 46), Desikan (1957 to 1963), Raman (1957 to 1969), Gururaja Rao (1957-60), Narasimhaiah (1980) in Tamilnadu; Subba Rao (1950), Subramanyam (1956), Sarkar (1966), Sampath (1980), Pulla Reddy (1986) in Andhra Pradesh; John (1974 to 1985) in Kerala; Nagaraja Rao (1964), Sundara (1975) in Karnataka are of great importance for, these works have thrown new light on various facets of the culture hitherto unknown and has brought to light new types of Megalithic burials. Observations of Gururaja Rao (1972) and Sarma (198) in this context are no less important. Krishnaswami's (1949) typological classification has been further reviewed by Sundara (1975) in the light of subsequent discoveries by him necessitating modifications in the terminologies and addition of new terms. His classification of Megalithic burials, based on types and characteristic traits include three main groups, viz., (a) chambered tombs, (b) the unchambered tombs and their variations and (c) stone alignments. While the first two groups are associated with burials, the third though Megalithic in character, is essentially non-burial in nature.

The amazing variety and complexity of the culture has necessitated many number of systematic excavations in South India. As a sequel, numerous burial and habitational sites have been excavated in South India to understand various problems involved, viz., their authors, chronology of types, settlement pattern, relationship between Megalithic and Chalcolithic Black and Red ware, other material culture and Iron technology, etc.

The most important excavations of burial sites in the region include Sannur (Banerjee and Soundara Rajan, 1950-53 and 1959), Kunnattur (Krishnaswami and Saran, s1955-56),Amrithamangalam (Banerjee, 1954-55), Maski (Thapar, 1957), Jadigenahalli (Seshadri, 1960), Yeleswaram (Waheed Khan, 1963), Nagarjunakonda (R. Subramanyam, 1975), Terdal and Halingali (Sundara, 1975), Machad and Pazhayannur (Mehta and George, 1978), Koppa (Narasimha Murthy, 1977), Heggadehalli (Kamath, 1982), Tadakanahalli (Nagaraja Rao, 1985), Auroville (IAR, 1984-85), Tiruvakkarai (IAR, 1984-85), Komaranahalli (IAR, 1986 - unpublished).

Among the habitation sites, where Megalithic Black and Red ware and other associated cultural remains have been retrieved, mention may be made of Uraiyur (IAR, 1964-65), Paiyampalli (IAR, 1964-65), Perur (Soundara Rajan, 1970), T.Kullupatti (IAR, 1976-77), Appukallu (Raman, 1977), Mallapadi (IAR, 1977-78), Piklihal (Allchin, 1960), Kesarapalle (Sarkar, 1966), Pedda Marur (IAR, 1977-78), Ramapuram (IAR, 1982-83), Bhadrachalam (IAR, 1983-84), Tekkalakota (Rao, 1965), Sanganakallu (Ansari & Rao, 1969), Hallur (Rao, 1971), Kodekal (Paddayya, 1973), T. Narasipur (Seshadri, 1974), Hemmige (Nagaraju and H. Rao, 1975), Chandravalli (IAR, 1977-78), Banahalli (IAR, 1983-84).

Although many of the problems relating to the culture are still subjected to various hypothesis, craving for further indepth studies, the above explorations and excavations have revealed few noteworthy evidences, viz., (a) that the Megalithic culture succeeded Neolithic/Chalcolithic culture, (b) Iron technology was introduced

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first in the south, (c) Megalithism influenced by the local geological environment had its beginning in the south and (d) the culture continued to survive even during early historic period particularly in Tamilnadu, where Sangam and post-Sangam literary evidences available to similar burial customs then in vogue (Srinivasan, 1960).

Chronologically, the South Indian Iron Age Megalithic culture has been bracketed between 1200-1000 B.C. to about 150 B.C. (Agrawal, 1982). Thus, it is clear that the study of problems pertaining to Megalithic culture in India since 1823 has passed various stages of development and in the process, new ideas have emerged in the classification of types, their chronology and distribution, rituals and customs, economy and food habits, metallurgy and ceramic industry. In the field of racial biology of Megalithic people also, considerable work has been done. From the study of Morphometric and statistical analysis of human skeletal remains and cranial indices from the Megalithic burials, Kennedy and Levisky (Misra, 1985) have opined that "India's Iron Age populations were relatively heterogeneous and not representative of a single homogeneous racial element".

As is well known, numerous types of Megalithic burials have been reported from almost all the districts in Karnataka. Number of habitational sites with Neolithic/Chalcolithic cultural material subjected to excavation at Maski (Thapar, 1957), Hallur (Nagaraja Rao, 1971) and T. Narasipur (Seshadri, 1974) have been helpful in fixing the chronology of Megalithic culture firmly in Karnataka.

When compared to the sites in Southern Karnataka, Northern Karnataka is remarkable for its Megalithic remains. After Meadows Taylor's (1853) work in Gulbarga, Raichur and Bellary, much work has been done in this field. Sundara's work in this respect deserves attention. His work has brought to light not only large number of new Megalithic burials scattered in the northern districts but also discovered an unique burial known as Greek or Latin Cross type.

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Further, he has shown the influence of geology of the region on the Megalithic burials of that region.

The main types reported in the North Karnataka Megalithic complex include passage chambers of the Konnur, Kaladgi and Terdal type, port holed chambers of Rajan Kollur, Aihole and Hirebenkal type, oblong cists, all belonging to chambered tomb group; cairn stone circles, pit burials, stone circles and barrows of unchambered group and stone alignment of non-burial group (Sundara, 1975).

As already mentioned, excavations of couple of burial and habitation sites have revealed varied information about the material culture of the people, burial systems, customs, etc. Discussing the chronological brackets for the culture, Sundara (1975) opines "The Megalithic culture in North Karnataka began from about 1200 - 1100 B.C. flourished upto 3rd - 2nd century B.C. and survived upto circa 1st century B.C. in North Karnataka".

Even though systematic survey of Megalithic burial types on the pattern done in North Karnataka is wanting, enough work has been done in Southern Karnataka, particularly in the districts of Bangalore, Kolar, Coorg and Mysore. Before discussing the types of burials noticed in the region under study, it is necessary to know the distibution patern of Megalithic types in the neighbouring districts which would enable to know the possible influence, if any, on the distrbution of the Megaliths in Malnad.

From a review of the types in the districts of Chitradurga, Kolar, Bangalore, Mandya, Mysore, Coorg and South Kanara, it is noticed that a particular type occurs in more than one district, hence, grouped districtwise. For the sake of convenience and to understand the character of the type, these have been grouped under nomenclature already used in the classification of North Karnataka types and groups (Sundara, 1975). Since the non-burial group is absent in the southern

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region, the types available could be classified under two burial groups, viz., (a) chamber tomb group and (b) unchambered group.

(a) Chambered tombs: Under this group, three types are noticed. Dolmens with port-holes, trancepted cists with passage and cists with or without port-hole.

(1) Port-holed chamber types have wide spread distribution in the neighbouring districts of Coorg (Cole, 1869), South Kanara (Sundara, 1970) to the south and in the Kolar and Bangalore districts (Sundara, 1975) to the east of the region under study. Sundara (1975) has compared the types from both the regions to Rajankolur and Hirebenkal group respectively. The southern group compared with Rajankolur type has chambers of varying size and oblong plan. Rough undressed orthostats and capstone are used to raise the chamber. Port-holes are found in different directions. It is devoid of cairn circle packing. The eastern group from Kolar and Bangalore districts are of Hirebenkal type. On plan, these are squarish or occaionally oblong on plan. Chambers are either in full relief from the ground or half buried. Orthostats with or without port-holes are thick and the capstones oval or circular on plan. The port-hole is semi-circular in shape, has no specific orientation and is closed with a slab. Devoid of cairns, these are enclosed by rubble wall of orthostats. Beyond the northern limits of Malnad region in Chitradurga district, chamber tombs are designated as Brahmagiri type, different from the Rajankolur and Hirebenkal type. Since this type is not found in the Malnad region, detailed discussion may not be necessary. Besides these, there may be a few sub-types with variations which are probably due to local influence.

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(ii) Transcepted-cist with passage: This type has been reported from the sites east of the region under study in Kollegal taluk along the borders between Mysore and Tamilnadu (Narasimhaiah, 1980). This indicates the western limit of its spread from the neighbouring Tamilnadu where it occurs profusely in the Coimbatore district. It is not reported in other districts bordering the region under study. Hence, detailed description is not attempted.

(iii) Cists: This type is found in Tumkur (Seshadri, 1952), Bangalore (Sundara, 1975) and Coorg (Subbaiah, 1978) districts. Excavations of oblong cists of Ittigebailu in Bangalore district (Gururaja Rao, 1972) are found half buried and the remaining half in relief. Oriented east-west, these were enclosed by circles of half buried boulders. Cists were built using thin slabs, one having a port-hole and covered by huge captstone. Arch stones provided in front of port-holed chambers is a noteworthy feature. Cists of the Tumkur district are totally disturbed. These are reported to be 2.5 m squares (Seshadri, 1956) devoid of stone circles. Cole's excavation (1868) of cists in Coorg revealed that the larger cists group measured 2.5 m x 1.80 m x 1.90 m in length, breadth and depth respectively. The smallest measured 1.80 m in length, 1.70 m in breadth and 1.2 m in depth. Port-holes were provided in different directions. Megalithic Black and Red ware, iron implements and jars were encountered in the excavations. In southern part of Coorg, cists are devoid of stone circle while in the northern part near Kushalnagar (Fraserpet), these are enclosed with upright slabs. Besides large number of Dolmenoid cists occur in Ramaswami kanive, Doddamolathe, and in the vicinity of Somwarpet, all in north-Coorg.

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Excavations of double chambered types,pit circles conducted at Koppa in the Piriyapatna taluk of Mysore district (Narasimhamurthy, 1977), have reveald more information about the burial architecture, pottery, iron implements and other material culture. The dolmens were divided into two halves by providing a central orthostat. In one burial, central orthostat dividing the chamber was found "placed below the level of other four outer orthostats". The other important discovery, however, is the paddy husk probably indicating the food habits of the Megalithic people.

(b) The unchambered group in the districts bordering Malnad region include cairns, pit circles, stone circles, urns and menhir.

Cairns: This type is reported from the north-eastern area of the region under study in Kolar district (Gururaja Rao, 1972). These are oval or round on plan composed of boulders and rubbles rising above the ground level measuring 40-80 cms in height. Whether these are heaped over a chamber or a pit in these sites could be known only from excavation.

Pit circles: Two extensive sites of this type are reported from Brahmagiri in Chitradurga district (Wheeler, 1948) in north-west border and in Coorg district (Narasimhamurthy, 1977) forming the southern boundery of the region under study. Strangely, this type has not been reported from the other neighbouring regions. At Brahmagiri amdist cists, about nine pit circles have also been found (Wheeler, 1948). Excavation of four of these pits have revealed that pits were either oval or circular on plan and all having ramps accommodating two or three granite blocks at the bottom floor level. One pit was found sealed by a slab having no functional aspect. The pit varying in dia from 7 m to 11 m was enclosed by single or double circles, the gap being filled with cairns or clay earth. The pits contained iron objects of varying type, human bones and the usual pottery formed the grave goods. In Coorg district, these are found in hundreds in each

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site in the Upper Kaveri valley. The circles are composed of irregular granite boulders of varying height (3 cm to 65 cm). The pits dug in the centre contained the human skeletal remains and some times found resting on dressed stone slab along with grave furnitures (Narasimhamurthy, 1977). On the basis of ceramic evidence, antiquities retrieved from these burials and their distribution pattern, Sundara (1975) suggests "the pit-circles are regular burials probably belonging to the local people, who were previously in the Neolithic stage".

Stone circles: This type has been reported from numerous sites in the Kolar, Bangalore, Mysore, Mandya and Tumkur districts in Southern Karnataka. Seshadri (1956) and Gururaja Rao (1972) have listed them in detail. In the explorations conducted by Krishnamurthy (IAR, 1965 to 1975) in Kolar and Mysore districts under the village to village survey scheme of the Achaeological Survey of India, a large number of sites of this type have come to light. Recently (1989 and 1990), I have noticed stone circles in Valnoor in Somwarpet taluk of Coorg district and at Benegal in Periyapatna taluk of Mysore district. Though this type has wide spread distribution in Southern Karnataka, its exact nature could be known only from excavation. In the absence of surface indications, in the middle portion, it is rather difficult to ascertain whether these circles enclose a pit burial or underground cist burial.

In this context, excavations of stone circles conducted by Seshadri at Jadigenahalli in Hoskote taluk of Bangalore district is noteworthy (1960). This is the only site in Karnataka where Sarcophagus burial is reported. As is well known, in Tamilnadu, Sarcophagus burial is a common feature.

Urn burials: This type, devoid of any lithic appendage, is reported from Wobbasandra near Gudibanda in Kolardistrict. Occurrence of pottery, iron object and bones is noteworthy (Gururaja Rao, 1972). While this is the only site noticed in the north of the region under study, Sundara (1974) has reported an urn burial site at Puttur in

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South Kanara, bordering the southern limits of the Malnad region. He noticed three urns in a foundation trench at an average depth of 60-70 cms. Urns of Red ware were coarse, thick in section; more than 1 m high and have wide mouth, globular body, narrow truncated bottom and neck decorated with thumb impressions. He opines that these are closely similar in fabric, type, size and decoration to that of Porkalam urns (Thapar, 1948). He retrieved two iron objects during the examination. Occurrence of gold ornaments and bronze plated iron is also noteworthy.

Menhirs: This type is reported from Garudanahalli (Cole, 1873) and Managondanahalli area (Sundara, 1975), both in Kolar district. Occurrence of menhirs inside the stone circle at the latter site is noteworthy. These rough, huge slabs are erected slanting without any specific pattern. This type does not occur in the eastern, western and southern districts bordering the Malnad region respectively.

Rock-cut caves: This is a common type in the Kerala group. Its occurrence in the South Kanara region reported by Sundara (1975) clearly indicates the extension of the type further north of Kasargod region in Kerala. The site reported by Sundara at Mudanidambur, a suburb of Udipi is cut into the laterite bed. The chamber is circular on plan (3.75 m dia) and hemispherical in elevation (2 m height). Circular opening at the top is at a depth of 90 cms from the ground level and is covered by a granite slab. He mentions of similar caves at Santure and Shivalli noticed by Dr. Bhat near Udipi.

With this background in view, an attempt is made to understand the Megalithic cultural remains, their nature, spread and chronology in the region under study.

The Megalithic remains of Malnad region attracted Mackenzie's attention as early as in 1873. He noticed numerous Megalithic burials in Hassan district and even excavated couple of burials at Sompura in the Arkalgud taluk of Hassan district. Since then, sporadic occurrence

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of Megalithic stone circles and cists have been reported by Seshadri (1956) in both Hassan and Chikmagalur districts. Menhirs were reported at Nilaskal (IAR, 1964-65) In Hosanagara taluk of Shimoga district. Sundara (1974) reported cists at Beluvinakudige in Sringeri taluk of Chikmagalur district and chamber tombs of the cists or dolmenoid cist variety at Arehalli in Tirthahalli taluk of Shimoga district. Occurrence of jars of Kajekaru type in a pit burial at Arehalli along with Black and Red ware is noteworthy. He also reported menhir of the Nilaskal type at Guddemaradi near Shimoga.

Although Megalithic burials indicated the presence of this culture in the region, no attempt had been made to know more about their distribution -typewise- on the model attempted by Sundara in the North Karnataka districts on the one hand or like the study of Megaliths in Coorg district by Subbaiah (1978) in the southern part of the region under study on the other. Besides, no habitation sites have been reported except the occurrence of Black and Red ware reported at Guddemaradi near Shimoga (Sundara, 1975).

As mentioned above, to gather more information and to understand the personality of the culture in the region, systematic exploration was taken up in the three Malnad districts of Hassan, Chikmagalur and Shimoga, revealing about 16 new burial sites and more than a dozen habitation sites yielding ceramics of Megalithic culture. The burial sites have been arranged in tabular format and their salient features have been highlighted below.

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Megalithic burial sites in the Malnad region and their main features

1.

a] Locality : Haraganahalli

b] Extent : 200 m (circum)

c] Type : Menhir

d] No. of each type : 7 Nos.

e] Distribution : Menhirs of medium size are found scattered around the eastern slopes of the hillock, all slightly leaning towards east.

f] Description : These have invariably conical top and are broad at the base. All are made on schist slabs. Quartz lumps are found scattered in the site. Mesolithic tools and broken portion of a ground axe were also found in the site.

g] Orientation : Arranged in an arc like row, north-south oriented*.

h] Measurement : Maximum: 2.5 m (H) x 2 m (B) x 4 cm (T)
Minimum· 1.08 m (H) x 0.90 m (B) x

i] Antiquity : Megalithic Black and Red ware occurs in the habitation site situated about 0.2 Km from the hillock.

*Comment : Whether the north-south orientation roughly of erecting the menhirs is deliberately intended is difficult to ascertain for, in the other sites with such menhirs do not show any particular orientation or alignment.

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2.

a] Locality : Belımallur

b] Extent : The habıtatıon sıte measures 10 acres and totally dısturbed.

c] Types : Menhır

d] No. of each type : 2 Nos.

e] Dıstrıbutıon patern. : Menhırs are at the south-east corner of the habıtatıon sıte. Dıstance between the two measures 2.70 m.

f] Descrıptıon : These are made on schıst blacks havıng poınted tıp due to delıberate oblıque cut on eıther sıde, thıck broad bottom, quartz lumps are found scattered at the base. A small pıt along the menhır shows a boulder below one of the menhırs.

g] Orıentatıon : roughly east-west orıented.

h] Measurement : Maxımum: 3 m (H) x 1 m (W) x 30 cms (T)
Mınımum: 2.5 m (H) x 0.70 cm (W) x 0.09 cm (T)

ı] Antıquıty : Megalıthıc Black and Red ware from both the habıtatıon sıte and from the pıts at the bottom of menhırs was collected. Other wares retrıeved from the sıte ınclude All Black ware and Red ware.

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3.

a] Locality : Sunkadakatte

b] Extent : 200 m (circum) (Locality 'B')

c] Types : Cairns

d] No. of each type : 10 Nos. of which 8 are totally destroyed in Locality 'A'. 2 Nos. in Locality 'B' intact.

e] Distribution pattern : Adjacent to one another. 2 m distance between the two.

f] Description : Situated on an elevated spot. Composed of granite and quartz lumps. Circular on plan.

g] Orientation : Roughly east-west oriented.

h] Measurement : Dia: 3 m east-west (externally), 4 m north-south
Height: 20 cms.

i] Antiquity : No habitational debris is noticed in the area.

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4.

a] Locality : Sulebailu

b] Extent : 10 m. (circumference)

c] Types : Menhirs

d] No. of each type : Solitary

e] Distribution pattern. : Situated 1 Km south-east of Guddemalleswara temple at Sulebailu near a low granite outcrop.

f] Description : It is of granite irregular triangular in shape, slightly leaning towards east, reddish earth heaped at the bottom alround. Few lumps of white quartz are found in the vicinity.

g] Orientation : East oriented.

h] Measurement : Maximum height · 3.2 m
" breadth : 1.3 m
" thickness : 0.95 cm

i] Antiquity : No cultural debris in the vicinity of Menhir. About 1 Km away towards north-west, Black and Red ware is picked up on the slopes of the hillock where Neolithic pottery and stone tools are also found.

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5.

a] Locality : Kenchapura

b] Extent : 20 m circum.

c] Types : Menhir

d] No. of each type : Solitary

e] Distribution pattern : Located adjacent to the main road in the vicinity, sand stone outcrop is also noticed.

f] Description : It is of sand stone, irregular triangular in shape, leaning slightly towards east. Top is slightly curved and the southern side seems to have been dressed.

g] orientation : East-west oriented.

h] Measurement : Maximum height : 6 m
" breadth : 2 m
" thickness : 0.25 cm

i] Antiquity : No cultural debris noticed in the vicinity of the menhir.

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6.

a] Locality : Jambavalli

b] Extent : 20 m circum.

c] Types : Menhir

d] No. of each type : Solitary

e] Distribution pattern : On an elevated spot about 20 m from the river bank.

f] Description : It is of granite with curved top. It is short and broad. It leans towards east.

g] Orientation : East-west orientation

h] Measurement : Maximum height : 1.2 m
" breadth : 0.90 cm
" thickness : 0.15 cm

i] Antiquity : No evidence of habitation site nearby.

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7.

a] Locality : Nilaskal

b] Extent : 10 acres

c] Types : Menhir

d] No. of each type : 35 Nos.

e] Distribution pattern : Found scattered on the eastern slope on an elevated grassy ground known locally as "Nilaskal bane" roughly oval on plan. Extant remains do not give a clear picture of the plan of erections. The average distance between menhirs is about 3 m.

g] Orientation : Roughly north-south oriented.

h] Measurement : Maximum height, breadth and thickness measure 4 m, 2.80 m and 55 cm respectively and minimum height, breadth and thickness measure 85 cm, 90 cm and 13 cm respectively.

i] Antiquity : A few Mesolithic tools and Neolithic pottery have been found. No Megalithic cultural debris is encountered.

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8.

a] Locality : Pratapakumari Grama

b] Extent : 50 m circumference

c] Types : Mehir

d] No. of each type : 2 Nos.

e] Distribution pattern : Located on an elevated spot overlooking the tank 1.5 Km to the west. The distance between the two measures 2 m.

f] Description : Both the menhirs are of granite, triangular in shape with slightly conical top, erected leaning towards north-east. Deliberate mud packing at the bottom. Quartz lumps are found at the bottom.

g] Orientation : Roughly east-west oriented.

h] Measurement : Maximum height, breadth and thickness measure 2.1 m, 2.40 m and 55 cm respectively. Minimum height, breadth and thickness measure 1.65 m, 0.12 cm and 10 cm respectively.

i] Antiquity : No other cultural debris encountered in the site.

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a] Locality : Mulekalenahalli

b] Extent : 10 m circumference.

c] Types : Menhir

d] No. of each type : Solitary

e] Distribution pattern : It is located to the north-west of the village.

f] Description : It is a huge block of granite, triangular shaped with curved conical top. Southern face is dressed and smooth, whereas the northern face is rough and undressed. Bulbous bottom. It leans towards east. Mud packing alround the bottom mixed with quartz lumps.

g] Orientation : Roughly east-west oriented.

h] Measurement : Maximum height, breadth and thickness measure 2.65 m, 2.15 m and 0.75 cm respectively.

i] Antiquity : A few microliths of non-geometric group made on quartz are found strewn alround.

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10

a] Locality : Halekalgudda

b] Extent : 100 m east-west x 150 m north-south

c] Types : Menhir

d] No. of each type : 5 Nos.

e] Distribution : Scattered on the slopes of foothills of Halekalgudda and does not indicate any plan.

f] Description : The menhirs of pinkish granite slabs almost triangular shaped with conical top and have broad base. The distance between each on an average measures 20 m. While two lean towards west, the rest lean towards east. All exhibit yellowish patination. The site overlooks the tank 0.5 Km to the south.

g] Orientation : Roughly north-south oriented.

h] Measurement : Maximum height, breadth and thickness measure 2.15 m, 1.90 m and 60 cm respectively. Minimum height, breadth and thickness measure 1.80 m, 0.15 cm and 15 cm respectively.

i] Antiquity : Except few non-geometric microliths, no other evidence of cultural debris.

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11.

a] Locality : Pungame

b] Extent : 10 acres area

c] Types : Stone circles

d] No. of each type : Earlier, Seshadri had mentioned about 20 circles and menhirs. But only five circles were found in a disturbed condition.

e] Description : Circles are round or oval in shape. While two circles were composed of 12 and 14 vertical slabs and boulders of close grained haematite, the remaining circles contained 24 and 20 boulders. No evidence of cairn packing. The nature of burial could be ascertained after excavation. Large quantity of quartz strewn in the site.

g] Orientation : Roughly north-south oriented.

h] Measurement : Maximum dia: 7.60 m east-west, 7.00 m north-south. Circumference: 25.70 m.
Minimum dia: 6.00 m east-west, 5.70 m north-south. Circumference: 16 m. Maximum length and thickness of boulders measure 1.70 m and 0.55 m respectively.

i] Antiquity : No cultural debris.

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12

a] Locality : Kondajji

b] Extent : 20 acres

c] Types : Stone circles

d] No. of each type : Earlier, Seshadri had mentioned 24 stone circles. Now only 8 remain that too in a disturbed condition.

e] Distribution pattern : Extant circles scattered are on the slopes of the foothills of a hillock known as Sigegudda, overlooking a tank 0.5 Km away towards east. Distance between circles measure 4-6 m.

f] Description : The site is under cultivation. A few are remaining. Original position of stones indicating the circle is also disturbed. Some seem to have been reset. Boulder of blackish close grained stone has been used. The maximum and minimum no. of stones forming the circle are 17 and 11 respectively. Devoid of packing material. Nature of burial could be known only after excavation.

g] Orientation : Roughly north-south oriented.

h] Measurement : (a) Maximum dia. 9.30 m E-W; 9.30 m N-S. Circumference: 33 m.

(b) Maximum length and thickness of boulders measure 80 cm and 45 cm respectively.

i] Antiquity : No other cultural debris noticed.

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13

a] Locality : Honnavara

b] Extent : 2 acres

c] Types : Stone circles

d] No. of each type : 6 Nos.

e] Distribution pattern : Found scattered in a field to the south of the village. Three are almost intact and the remaining three are totally disturbed. The distance between each measure 6-8 m.

f] Description : The circles are being disturbed due to heavy agricultural activity. Boulder of small to medium size, partly hidden, arranged in round to oval shape. Rock material used is blackish and close grained, probably Haematite. Since disturbed, not possible to ascertain excact number of stones used for the circle. Devoid of packing material. Centre portion is flat. Nature of burial could be known only through excavation.

g] Orientation : Roughly north-south oriented.

h] Measurement : Maximum dia. 8.35 m east-west; 8 m north-south.
Circumference: 24 m.
Minimum dia. 6 m east-west, 5.70 m north-south.
Circumference: 15 m
Maximum and minimum length and thickness measure 60 cm, 20 cm; 40 cm and 15 cm respectively.

i] Antiquity : No cultural debris noticed.

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14

a] Locality : Beluvinakudige

b] Extent : 3 acres

c] Types : Stone circles (with highly disturbed cists)

d] No. of each type : 24 Nos.

e] Distribution pattern : The site is situated at an altitutde of 1000 m MSL in a thick forested area. These are clustered, distance between each measure 2 m on the eastern slopes.

f] Description : Due to thick forest and grass covering the circle stones, it is difficult to ascertain the number of stones used to form the circles. From the indications available, it is clear that both slabs and boulders probably of granite have been used. The exact pattern of arrangement of cists could not be ascertained due to disturbed condition. However, average measurement of chambers measure 2 m x 2.20 m internally. Existence of port holes in the orthostats can not be ruled out.

g] Orientation : Difficult to ascertain.

h] Measurement : Maximum circumference of the circle : 15 m.
Dia. 4 m north-south.
Minimum circumference: 8 m.
Dia. 2 m.

i] Antiquity : Black and Red ware is reported to have been retrieved from the burials in the site.

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15

a] Locality : Sompura

b] Extent : 5 acres

c] Types : A) Pit circles
B) Cairns

d] No. of each type : (A) 7 Nos; (B) 5 Nos.

e] Distribution pattern : Pit circles and cairns are scattered on the slopes of an elevated area. Five cairns are 25 m to the north-east of pit circle group.

f] Description : (A) Pit circle groups are round in shape, varying from 1 to 3 circles. The pits seem to have been covered by a slab as is evident from portions visible on the surface. Circle is indicated by erecting thin stone slabs vertically and by keeping round boulders. Vertical members lean towards the pit. Disturbed pit sections are composed of number of granite, quartz and haemitite embedded in the reddish murram.

(B) Cairns devoid of stone circles are composed of rubble of granite, quartz and haemitite. These are round in shape.

g] Orientation : Roughly north-south oriented.

h] Measurement : Stone circles enclosing the pits measure 50 m to 21 m in circumference. Burial with three circles measure 50 m at the outer, 46.40 m at the middle and 18 m at the inner-most respectively. Number of vertical slabs vary from 33 to 12. Cairns measure 10-15 m in circumference and the height varies from 30 to 50 cms from the ground level.

i] Antiquity : No other cultural material is noticed. However, earlier excavations by Meckenzy has revealed Black and Red ware, iron objects, etc.

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16

a] Locality : Shigodu

b] Extent : 10 acres

c] Types : (A) Cairn stone circles (one with a vertical slab in the circle).

(B) Cairn rectangles.

d] No. of each type : (A) 10 Nos; (B) 2 Nos.

e] Distribution : While cairn stone circles and barrows are found in one locality, in another locality, only stone circles with a vertical slab is noticed. 'A' locality is on an elevated spot and 'B' locality is in a depression. Both are near a tank.

f] Description : (A) Stone circles enclose cairn packing with cap stone at the centre. These are oval or circular on plan. Thin vertical slabs and roundish haematite boulders are provided around the cairns composed of lumps of quartz, granite and haemitite with capstone at the centre. In one circle, a vertical dressed slab erected is noteworthy.

(B) The barrows are rectangular or oblong on plan having a capstone at the centre partially visible. Rubble heap composed of quartz and granite.

g] Orientation : Roughly north-south oriented.

h] Measurement : Maximum and minimum circumference of circles measure 25 m and 15 m respectively. Circles comprise 18 to 25 stones. Distance between each circle stone member measures 30-60 cms. Boulders measure 1 m, 55 cm and 35 cm in length, breadth and thickness respectively. The height of cairn from the ground level varies between 70 cm to 1 m. The vertical slab inside the circle measure 80 cm, 40 cm and 30 cm in height,breadth and thickness respectively.

i] Antiquity . No other cultural debris is noticed.

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17

a] Locality : Ullenahalli

b] Extent : 30 m circumference

c] Types : Dolmens without stone circles

d] No. of each type : 2 Nos.

e] Distribution pattern : Both are situated amidst thick vegetation. The distance between the two measures 2 m.

f] Description : The chambers are rectangular on plan. Eastern orthostat is missing in both the chambers. Arthostats arranged in clockwise pattern are rough, thick and made of pinkish grey granite. The capstone is rectangular on plan.

g] Orientation : Probably east-west oriented.

h] Measurement : 1.30 m north-south x 1.90 m east-west. The capstone measures 2.75 m east-west x 1.90 m north-south x 15 cm in length, breadth and thickness.

i] Antiquity : No other cultural material is noticed.

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18

a] Locality : Hosalli

b] Extent : 100 m circumference

c] Types : Menhir

d] No. of each type : 2 Nos.

e] Distribution pattern : Isolated menhirs situated at a distance of 50 m from each other. Granite outcrops in the vicinity.

f] Description : Both are made on granite of pinkish and grey colour. Roughly triangular in shape. One leans towards east. Yellowish patination. Rough and thick.

g] Orientation : Roughly north-south orientation.

h] Measurement : a) Measures 1.70 m in height, 1.10 m in breadth and 65 cm in thickness.

b) Measures 1.50 m in height, 1.10 m in breadth and 60 cm in thickness.

i] Antiquity : No other cultural material is noticed.

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19.

a] Locality : Kuduvinahosalli

b] Extent : 2 acres

c] Types : (A) Port holed chambers with circles (disturbed)

(B) Pit burials indicated by thick capstone.

e] Distribution pattern : (A) 2 Nos.; (B) 2 Nos.

f] Description : (A) Chambers are rectangular on plan. The four orthostats are arranged neither in clockwise nor in anticlockwise dirction. These are thick and rough covered by a huge capstone. The broken northern orthostat of one of the chambers has a curved edge probably indicating port-hole. On the exterior is a stone circle of haemitite boulders, 12 to 14 in number, of small to medium size.

(B) Pit burials in locality 'B' are indicated by huge capstones of pinkish granite almost oval in shape, thick and rough.

g] Orientation : Both types roughly east-west oriented.

h] Measurement : On an average, chambers measure internally 1.75 m east-west x 1.30 m north-south and height 1.50 m. Capstones measure 2.25 m x 1.40 m x 11 cm in length, breadth and thickness.

Maximum circumference of stone circles measures 18 m.

i] Antiquity : No other cultural debris is noticed.

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20

a] Locality : Siddapura

b] Extent : 200 m circumference.

c] Types : Pit circles (without stone circles)

d] No. of each type : 4 Nos.

e] Distribution pattern : On the slopes of an elevated thickly vegetated area.

f] Description : These are indicated by slight heap visible on the surface. Megalithic nature is attested by the occurrence of few All Black ware sherds. Circle boulders seem to have been removed.

g] Orientation : Roughly east-west oriented.

h] Measurement : Maximum dia. 2 m north-south; 3 m east-west (externally)

Minimum dia. 1.5 m north-south; 2.5 m east-west (externally)

i] Antiquity : Few sherds of All Black ware.

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21

a] Locality : Savalanga

b] Extent : 3 acres

c] Types : Stone circles (highly disturbed)*

d] No. of each type : 20 circles.

e] Distribution pattern : All are situated on the slopy flat surface. Distance between each about 2 m.

f] Description : These circles are circular in plan. Irregular shaped boulders of schist measuring 80 cms in thickness and 45-60 cms in length are used. All are single circle type. In the centre, nothing is visible. Probably these enclose a pit.

g] Orientation : East-west

h] Measurement : Maximum dia. 3 m east-west; 4.10 m north-south (externally)

Minimum dia. 2 m east-west; 3.40 m north-south (externally)

i] Antiquity : No habitational debris nearby.

* Comment : A recent re-examination revealed that even the disturbed site is being used as agricultural land. None of the evidence noticed earlier exists now.

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22

a] Locality : Chinnukatte

b] Extent : 200 m north-south x 11 m east-west

c] Types : Stone circles (Single, double and one with a short menhir)

d] No. of each type : 20 Nos.

e] Distribution pattern : Situated on an elevated area sloping towards east.

Description : Circles in oval or round shape are formed by arranging haemitite boulders of irregular shape. The thickness and length of which vary between 90 cm to 40 cm and 1.2 m to 0.60 m respectively. Each circle contains 12-13 stones.

g] Orientation : Roughly east-west oriented.

h] Measurement : Maximum : 26 m circumference; 10 m dia.(north-south)

Minimum: 9 m circumference, 3 m dia (north-south)

i] Antiquty : No habitational debris in the vicinity.

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As is evident, the number of megalithic sites and burials noticed in the Malnad region is very limited compared to the rich sites reported from North Karnataka as well as to the sites in the neighbouring districts bordering it. Typewise distribution is also resricted to a few pockets. Thus, southern Malnad sites along the Upper Kaveri accommodates numerous burial types compared to the sites in the northern part of the region (Shimoga district) which is dominated by habitation sites.' The burials noticed in the region could be classified under five groups as follows:

a] Port-holed chambers and cists
b] Cairns
c] Pit-circles
d] Stone-circles
e] Menhirs

In the light of the above observations, it is necessary to understand the pattern of distrbution of the five types found in the region and their relative position with reference to the similar types reported form the neighbouring region. This would also enable to probe the possibilities of identifying the focal as well as peripheral area of the types, if any.

a] Port-holed chambers and cists: The port-holed chambers and cists of Malnad are of varying height and size; rectangular or oblong on plan; orthostats and capstones used are thick and rough except at Beluvinakudige where thin and small slabs have been used obviously due to the very location of the site at a higher altitude. Hardly one can find a chamber "in-situ" in the Malnad sites making it rather difficult to ascertain the direction of the port-holes. Excavation by Cole (1868) and others in the adjacent Coorg district further south of the region revealed miniature and double spouted vessels which seem to be a feature of these burials. However, due to their dilapidated condition, nothing much could be known about the grave furniture of the Malnad burials of this type.

Port-holed chambers and cists of Rajankolur and Hirebenkal type reported from various sites in the beighbouring southern and eastern boundaries of the region under study have already been discussed. In the southern Malnad region, these types are found in Kuduvinahosalli and Ullenahalli in the Upper Kaveri valley of Hassan district. The northern extension of this type within the region under study could be located at Arehalli in Tirthahalli taluk of Shimoga district. In the intermediary region of Chikmagalur district, two sites with cist burials are located at Mattavara (Seshadri, 1956) and at Beluvinakudige (Sundara, 1975), the latter situated at an altitude of 1000 m above MSL further north of Hassan district. As already mentioned, these types are found profusely in the Somawarpet and Virajpet taluks in Coorg district further south of Hassan district. Interestingly, another group of Rajankolur type reported from Kajekaru (Sundara, 1975) beyond Coorg in the coastal belt is a noteworthy point for, Sundara postulates the diffusion of this type from the west coast region to the upghat region.

Thus, it is clear that the port-holed chamber-tombs of Rajankolur in Southern Karnataka are found mostly concentrated in the area comprising the upghat region of Coorg and in the west coast immediately adjacent to it. The sites scattered in the Upper Kaveri in the Hassan district and further northwards in Chikmagalur district of Malnad probably form the peripheral zone. Although similar types occur in large number in the North Karnataka region, absence of such types in the intermediary region of Dharwar and Chitradurga further corroborates the above view.

Discussing the development of port-holed chambers, Sundara (1975) opines that among other regions, Southern Karnataka having extensive distribution of this type as one of the possible areas from where North Karnataka might have received the tradition. He further opines that the sites at Belur, Badakajekaru in the western coast with port-holed chambers have direct bearing on the development of this type from the

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preceding passage chamber types known as Konnur and Kaladgi types in the Northern Karnataka region. He hypothesizes the possibility of the development of port-holed chamber types of the Malnad and coastal region from the Kaladgi type, also found in the Hallur area bordering the maidan belt of Malnad. But this hypothesis does not seem to be well founded for, the distance between Hallur and Arehalli, the northern most site having this type in the Malnad region, is more than 100 Km - besides in the intermediary region no megaliths of this type have been noticed. If we take into account the distribution of large number of sites with port-holed chambers in the Coorg district and in the coastal district of South Kanara, it could be reasonably postulated that the Rajankolur type of North Karnataka and the coast-ghat port-holed type (similar to Rajankolur type) of Southern Karnataka seem to have developed independently having their respective focal and peripheral areas. Thus, as mentioned above, the Arehalli chamber tombs in Shimoga region which Sundara postulates as a link site between Hallur in the north and coastal sites in the south is in all probability forms the peripheral zone of the type with the focal area centered in Coorg and the west coast sites in South Kanara district. Similarly, the Rajankolur and the sites north of Hallur may represent the focal and peripheral areas respectively of North Karnataka region. It appears, therefore, that two independent groups of port-holed chamber type emerged simultaneously. Whether these were of native origins or due to migration through the coastal belt, is a matter of hypothesis and needs further probe.

b] Cairns: Cairns are noticed in three sites, viz., at Sunkadakatte in the Honnali taluk of Shimoga district in the northern limits and at Shigodu and Sompura in Arakalgud taluk of Hassan district in the southern limit of Malnad region. At Shigodu, cairns are found along with stone circles while in Sompura, these are found in association with pit-circles.

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These are oval, oblong or rectangular on plan. Cairns vary in height from 30 cm to 70 cm. The northern group is composed of quartz and granite rubbles besides, pebbles. The exact nature is difficult to postulate. Height of cairns of southern group is prominent and traces of capstone at the middle is partially visible probably covering the chamber. Thorough excavation may reveal more information about the nature of these burials and local peculiarities, if any. Further with limited number of burials as well as sites in the region, it is rather difficult to trace any connection between the two groups in the Malnad region.

Extensive cairn stone circles have been reported from North Karnataka region (Sundara, 1975) and a few sites in the Kolar region (Gururaja Rao, 1972). A few cairns occur in the adjacent Coorg district further south of Hassan district. Further, in the absence of localities with extensive sites with cairns in and around the region and the number of cairns found is too small in each site, it is difficult to know their relative affiliation, if any, with those of either North Karnataka or adjacent regions.

c] Pit circles: Pit circles form the third type of burials in the Malnad region. These are distributed in three sites, one in Shimoga district in the Upper Tungabhadra valley and the remaining two are located in the Upper Kaveri valley in the Hassan district.

These pit circles are indicated by a capstone or by a heap at the centre enclosed by stone circles. However, at Kuduvinahosalli and Siddapura, stone cicles seem to have been removed. Sompura pits are normally enclosed by single circle. Interestingly, one of the burials with three circles of upright stone slabs is also found. Whether these burials have ramps as noticed at Brahmagiri (Wheeler, 1948) or have dressed granite stone slabs in the pits as in the case of sites in Coorg district and whether these are of the people who have previously in the Neolithic stage as postulated by Sundara with regard to North

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Karnataka types is a matter to be examined. Generally in the orthostatic Megaliths, the edges of each orthostat are roughly dressed to get straight edge. In the case of slab cist circles, the slabs of the circle or the top edge are well dressed. Thus, there are two kinds of dressing. Which type of dressing is noticed in the Coorg Megalithic is not clear from the description. A detailed excavation in some of the sites may throw more light on these problems.

' It may be mentioned here that the possibility of missing pit circles are more considering the systematic vandalism caused due to heavy agricultural activities in the region. Moreover, the sites noticed are too meagre and no cultural debri is also encountered. Therefore, it could be reasonably surmised that the types noticed in the region are the surviving examples of a popular type and they do not contribute in identifying the influence of neighbouring regions or in identifying the focal and peripheral zones, if any.

d] Stone circles· Extensive sites with Stone circles are found in all the neighbouring districts bordering the region under study. As already mentioned, half a dozen sites of this type are found in the Malnad region proper. Of these, two are in the northern part in Shimoga district and among the remaining four sites, one is in the southern tip of Hassan district along the Upper Kaveri and the other three are in the northern end of the same district. Interestingly, in the intermediary region of Chikmagalur district, this type is reported from Sakrepatna (Seshadri, 1956). However, a re-examination of site did not reveal any evidence due to agricultural activity.

The stone circles in the northern Malnad region are found in clusters in both the sites. Although at Savalanga, the site is totally disturbed due to agricultural activity, the site at Chinnukatte indicates the basic features of this type in the region. Huge boulders have been used for indicating the circle. In one of the circles, a small dressed slab is found erected vertically. The boulder heap at

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the centre does not indicate the nature of burial. Similarly, the stone circles in the sites of Hassan district are also found in clusters. A dressed black stone found erected vertically in one of the burials at Shigodu is noteworthy. This feature was noticed by Seshadri (1956) at Pungame. During the re-examination, no such evidence was encountered. At Managondanahalli (Sundara, 1975), erection of menhirs within the stone circles is a common feature. Comparatively, in the menhirs noticed in the Malnad, stone circles are dressed and small in size. On an analogy, it could be surmised that the stone circles having boulder packing at the centre (Shigodu and Chinnukatte), may or may not accommodate a cist while the other type in the northern region of Shimoga district may encircle a pit burial in view of the non-availability of suitable rock material in the vicinity. However, the observation needs to be ascertained by thorough excavations.

As regards the distribution pattern, based on the evidence noticed, tentatively it could be surmised that the sites in the Hassan district may form the peripheral zone towards west having its focal point in the eastern districts bordering Malnad particularly in the Mysore, Bangalore and Kolar region. Similar observation may hold good for the sites in Shimoga district which seem to form the peripheral zone towards south with Belary, Chitradurga forming the focal point in the north.

e] Menhirs: Menhirs are found in the Upper Tungabhadra in Haraganahalli, a border village between Shimoga and Dharwar districts in the north and as far south as at Hosalli in Hassan district in the Upper Kaveri valley. There are in all ten menhir sites scattered all over Malnad region. These are found in clusters as well as solitary ones. Sites of the latter type are more. The former group is well represented at Nilaskal, about 8 Km west of Hosanagara town in Shimoga district. Interestingly, the site is situated at the mouth of the Hulikal pass connecting the coastal plains and the upghat region. Occurrence of Neolithic pottery in the site is a noteworthy feature and

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in fact, it is the only Neolithic site so far noticed in the Sharavati valley (Sundara, 1975). However, few Mesolithic tools have also been collected recently by me during the re-examination of the site.

Haraganahalli menhirs are of schist while at Kenchapura in Chikmagalur district, sand stone has been used. In the rest of the sites, menhirs are of granite. This clearly exhibits the knowledge of geology of the Megalithic people and their capacity to exploit it.

In most of the sites, menhirs are big to medium in size, rectangular or triangular in shape and normally found leaning slightly towards the east. Solitary menhirs are found provided with quartz and mud packing at the bottom. At Nilaskal, there are more than thirty menhirs of varying dimensions, the largest measuring 4 m in height and 2.8 m in breadth. The menhirs here do not indicate any plan in arrangement.

Halekalgudda in district Hassan and Haraganahalli in district Shimoga are the other two sites where more than two menhirs are found in the Malnad region. In Southern Karnataka, Perisandra (Cole, 1873) and Managondanahalli in Kolar and Bangalore districts respectively are the only sites where menhirs occur, of course, not in large number. Solitary menhir of the Nilaskal type is reported from Perisandra measuring 3.40 m in height and 90 cm in breadth. Managondanahalli menhirs are found in association with port-holed cists. Outside southern Karnataka in the peninsular-gneissic-complex zone of North Karnataka, a few sites with stone alignments and menhirs have been reported (Sundara, 1975). Of these, Hanumasagar is the most extensive site accommodating about 1000 menhirs measuring 1.50 to 2 m in height, all arranged diagonally on plan. Most of these are on bouldarry masses. The North Karnataka sites are situated more than 250 Km away from the Southern Karnataka sites and in the intermediary region, such types are not found. Thus, it is clear that the menhirs of northern and southern groups form seperate entities with seperate traditions.

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This is further corroborated by the nature of these types. Excavations of the menhirs in North Karnataka showed their non-burial appendage (Thapar, 1957). None of the menhir sites in the Southern Karnataka has been excavated, hence, nothing could be known about their nature. However, in the section of a pit excavated adjacent to one of the menhirs at Belimallur in the Honnali taluk of Shimoga district in the Upper Tungabhadra valley, few sherds of Megalithic Black and Red ware were collected by me during the exploration. Whether this evidence indicates the sepulchral nature of menhirs of the Southern Karnataka has to be examined by excavation. Sepulchral nature of menhirs in Kerala is already known (Vasudeva Puduval, 1939-40).

From the pattern of distribution of sites, it is evident that the prolific site at Nilaskal situated between the west coast and western ghat in the south-west with large number of menhirs may be considered as the focal point of the site and sites at Haraganahalli in the northern limit and Hosalli in the south-eastern limit of the Malnad region may form the peripheral zone. However, further research in the neighbouring regions particularly in the taluks of Mysore district bordering Kerala may throw more light in identifying possible migration, if any, from that region towards the Malnad on the one hand and the Kolar region on the other.

It is evident from the above observations that Megalithic burials' architecture suggests continuity of the culture in the Malnad region. However, a coherent picture of the personality of the culture could be obtained tentatively through co-ordinating the burials and the pottery collected from the habitation sites particularly in the northern part of the region.

Ever since the excavations at Brahmagiri and Chandravalli (Wheeler, 1948), numerous habitation sites with cultural debris ranging from Neolithic to Early Historical cultures have been excavated in Karnataka. Most of these excavations are again reported from Northern

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Karnataka, viz., Sanganakallu (Subba Rao, 1949 and Ansari & Rao, 1969), Maski (Thapar, 1957), Piklihal (Allchin, 1960), Tekkalakota (Rao, 1965) and Hallur (Rao, 1971). These excavations have provided meaningful picture of the Neolithic and Megalithic cultures and their chronological position in that region. Comparatively in Southern Karnataka, only three sites have been excavated so far, namely, T. Narasipur (Seshadri, 1974), Hemmige (Hanumantha Rao & Nagraju, 1975), both located in the Upper Kaveri valley in the T. Narasipur taluk of Mysore district. After a gap of nearly 17 years, Archaeological Survey of India excavated an extensive site at Banahalli in Malur taluk of Kolar district from 1982-83 onwards for a few seasons. In fact, Banahalli excavation has added some new information particularly with regard to the pattern of settlement of the Megalithic people and their iron technology.

Except for references to couple of sites yielding Megalithic Black and Red ware, nothing much is known about the nature of Megalithic habitations in the Malnad region. Besides, Megalithic habitation sites are conspicuously absent in the Upper Kaveri valley in the south and in the central Malnad region . Comparatively, in the northern part of Malnad, numerous habitational sites with cultural debris represented by ceramics ranging from Neolithic, Megalithic to Early Historical period have been noticed in the Upper Tungabhadra, further south of Hallur. Interestingly, a few habitation sites with Megalithic pottery are also noticed in the Lower Tunga valley.

To obtain a clear picture of these habitation sites with Megalithic cultural materials found in the exploration in the northern Malnad and to ascertain its chronological position, it is necessary to glance through the results of the excavations of habitation sites in the neighbouring districts of Mysore and Kolar in Southern Karnataka. Excavations at Hallur in the adjacent district of Dharwar may also be added to the list as the site is located only 2 Km away towards north

of one of the habitation sites noticed in the Upper Tungabhadra valley of Malnad and it would also help in comparing the Megalithic pottery retrieved during the explorations and to know their chronologial position.

As already known, these sites are very rich and the emphasis was mainly to understand the various aspects of the Neolithic culture and the study of Megalithic cultural levels seem to be just identical. Since Neolithic features reported in these sites are not relevant for our discussion at this stage, the review of these sites is restricted to the Megalithic level proper.

Hallur, district Dharwar: Excavations of the habitation mound (Nagaraja Rao, 1971) situated on the left bank of the river Tungabhadra brought to light four cultural sequences, namely, the Early Neolithic, the Neolithic-Chalcolithic, the overlap of Neolithic-Chalcolithic and the Early Iron Age - all classified under two periods. Period I is further divided into two phases representing Neolithic and Chalcolithic cultural assemblage.

The Period II here is characterised by the overlap of Neolithic-Chalcolithic and Iron Age assemblages. The excavator mentions that features of the phase II of Period I continues in this level except the blade industry. The occurrence of Black and Red ware, All Black ware both having white paintings identified as of Iron Age Megalithic ware by the excavator in Period II does not appear to be correct for, it is already discussed in the previous chapter about the Chalcolithic appendage of the White painted Black and Red ware pottery. The Black and Red ware of both Megalithic and Non-Megalithic cultures seem to have been combined making it rather difficult to ascertain the intrusion of Iron Age ceramics. Large scale horizontal excavation and a careful analysis of Black and Red ware would help in re-assessing the chronological position of cultures in this site. The other ceramics of Megalithic culture viz., Slipped ware, has also been reported.

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The Black and Red ware found here are similar to the ware found at Brahmagiri, Sanganakallu and Maski. Having thin section, it is made on good paste with polished and burnished surface. Shapes reported include bowls of varying size besides conical bowl and lid. The All Black ware also represents same fabric and shapes as Black and Red ware. Red ware of medium fabric has thin slip and slightly polished surface. Shapes include jar, platter, globular vessel and dishes. The finished iron implements found here include spear heads, knife blades, points and arrow-heads. Megalithic burials such as cairns, dolmenoid cists of the Kaladgi type have been located at 2 Km west of the site on the slopes of a hillock. On the basis of C-14 dates available for various levels, Period II has been dated to circa 1100 B.C. to 800 B.C.

T. Narasipur, District Mysore: Exavations at T. Narasipur located on the left bank of the Upper Kaveri in the T. Narasipur taluk of Mysore district revealed four periods (Seshadri, 1971), the last one being Early Historical. Period I and II represent Neolithic and the transitional stage from Neolithic to Chalcolithic respectively. Period III represented by layer 3 of the site is characterised by three typical Megalithic ceramic, viz., Black and Red ware, Black Polished ware (All Black ware), the Red polished ware and the ill fired Red ware. The last one seems to be a local feature. Black and Red ware has highly burnished and polished surface. It is wheel thrown and made of well lavigated clay found mixed with small percentage of sand and quartz probably used as tempering material. Mostly, plain but decorations with grooves, incised strokes, finger tip and nail impressions also occur. The shapes include bowls of varying size, dishes and jars. Black polished ware is identical to Black and Red ware in fabric and shapes. Red ware also has polished exterior surface. It is well fired and made on slightly inferior lavigated clay. Shapes include globular pots, jar, bowls, etc. Coarse Red ware is devoid of polished, slip and ill fired, probably used for rough work. Fragment of thin knife blade, dagger, dagger head, nail and a

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fragment of wire are the only iron objects retrieved from the Megalithic level. Glass bangles, beads of semi-precious stones and terracotta are the other cultural material encountered in the site. On the basis of C-14 dated of various levels and comparing them with the internal and corroborative evidence from other similar sites, the excavator is inclined to date the beginning and end of Megalithic culture here to 1000 B.C. to 1st century B.C. respectively.

Hemmige, District Mysore: Located in the Upper Kaveri valley, Hemmige is another habitation site excavated in the Mysore district (Hanumantha Rao and Nagaraju, 1974). Excavators have identified three-fold cultural sequences starting from Neolithic, Neolithic-Chalcolithic and the Early Historical. No concrete evidence of Megalithic culture has been found in this site except a few Black and Red ware sherds in one of the trenches in Area 'B' on the Adiyantittu islands. Megalithic Black and Red ware is reported to have occured on the surface just above the Neolithic-Chalcolithic deposits indicating the continuous occupation. However, the evidence is too meagre to assess the nature of Megalthic culture in the site.

Banahalli, Malur Taluk, District Kolar: This is the latest among the habitation sites excavated in Southern Karnataka. Excavations started in 1983 (IAR, 1983-84) continued for three seasons, revealing four periods, the upper-most being Early Historical. Period I is divided into two phases characterised by Neolithic and Neolithic-Chalcolithic assemblages. Period II is reported to be characterised by Chalcolithic-Megalithic overlap. Extended inhumation burials within the habitation appended with rubble stone cover has been postulated as one of the influences of Megalithic trait on the Chalcolithic culture. Other Megalithic cultural material encountered in this level include Black and Red ware and four iron objects comprising arrow head, nail, spear head and a shapeless object. Neolithic character of the site definitely continues in this level also, hence, it would be appropriate to designate this level as Neolithic-Chalcolithic probably overlapping with the Megalithic.

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Period III essentially represents Megalithic culture. A series of iron smelting furnaces exposed during the excavation seem to be the only evidence so far encountered in the Megalithic levels in any of the excavations of habitation sites conducted so far, in South India. Native production of iron objects comprising arrow heads, blades of dagger, nails, hooks can not be ruled out. Varieties of beads made on different materials have also been reported. Pottery of the period includes Black and Red ware and All Black ware. Settlement pattern is almost similar to earlier levels with circular plan and post-holes. Earmarking of a small area within these houses for iron working is a noteworthy feature.

Thus, the excavations clearly indicate overlapping stages from Neolithic to Chalcolithic and from Chalcolithic to Megalithic, etc. The overlapping phase of Chalcolithic to Megalithic at Banahalli needs to be probed further to understand whether similar transition took place in the adjacent Andhra sites as well as to find out whether this is a regional feature. However, it is a known fact that Deccan Chalcolithic (Deo, 1985) is succeeded by the Megalithic particularly in the Vidarbha region of Maharashtra. In the absence of C-14 dates on analogy, Banahalli cultural sequence could be tentatively compared with dated stratigraphy of Hallur.

The above review indicates that the Megalithic culture in the Southern Karnataka by and large intrudes into the Neolithic-Chalcolithic stage. However, the dates of intrusion may vary from site to site. In the light of these evidences, it is necessary to analyse the Megalithic pottery retrieved from the surface of various habitation sites noticed in the Upper Tungabhadra and the Lower Tunga valleys in the Northern Malnad region.

In about a dozen habitation sites located in the 60 Km stretch of the Upper Tungabhadra between Konantale and Kudli in district Shimoga, Megalithic pottery has been retrieved from the surface. Similar

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evidence is encountered in the Lower Tunga valley between Shimoga and Kudli also in Shimoga district. Habitation sites located in the Upper Tungabhadra valley include Haraganahalli, Belimallur, Didaguru, Sasivehalli, Nagasamudra, Nimbegondi, Halelingapura, Hosalli, Benakanahalli, Anaveri, Hadonahalli and Holehanasavadi. Pilangere and Abbaragatte are other habitation sites noticed in the Lower Tunga. In most of these sites, Megalithic Black and Red ware and All Black ware were found in considerable number while the Red ware assemblage encountered is very limited in number. Occurrence of Neolithic pottery in these sites is a noteworthy feature. The Chalcolithic Black and Red ware with white paintings also occur in a few sites along with Neolithic and Megalithic pottery. Chronological position of the Neolithic and Chalcolithic pottery has already been discussed in the relevant chapter.

It is too well known that the Black and Red ware is the most common fabric of Megalithic pottery. The other two being All Black ware and Red ware. All the three fabrics have been reported from hundreds of sites scattered all over Karnataka. Megalithic pottery retrieved from the habitation sites in the Upper Tungabhadra and the Lower Tunga valleys of Malnad region is no different from similar wares reported from other sites, as for example, from the excavated sites at Brahmagiri (Wheeler, 1948), Sanganakallu (Ansari-Rao, 1969) and Hallur (Nagaraja Rao, 1971).

The Malnad Iron Age Black and Red ware is wheel thrown, has medium to thin section. The clay used seem to be lavigated but slightly inferior. Sand particles noticed in a few sherds may have been used for tempering. The interior surface is black and have dull reddish-pink surface on the exterior. Both the surfaces are polished while in a few, dull surface is noticed; mostly the pottery is plain without any applied docorations. A lone sherd found at Belimallur has a 'graffitti. However, this does not seem to be a common feature. The common vessel types include bowls, dishes and vases of varying shapes.

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The technology adopted to produce thin fabric, viz., 'inverted firing' and 'double firing' method is much debated one (Singh, 1982). Megalithic ceramics of Malnad do not exhibit any regional features warranting special study. Therefore, it appears that the firing techniques used seem to be universal in nature.

All Black ware of Malnad is similar to the fabrics reported from the neighbouring regions. It is made of well lavigated clay, wheel thrown and has medium section. Both interior and exterior surfaces are polished. Few have coarse surface with striations. One sherd of same farbic but Grey ware found at Abbaragatte apparently similar to some extent the plain painted Grey ware of North Indian sites is noteworthy. The vessels are of medium to small size, shallow dishes, platters and bowls are in the ware. The Red ware group is characterised by few sherds of both big and small vessels. These have coarse thick to medium sections. Surface is rough. Vessel types include jar, bowls, etc.

Chronological position of Black and Red ware in Malnad: The trial digging at Benakanahalli in the Honnali taluk has been very useful for Megalithic Black and Red ware sherds found in layer 1 of Pit 1A indicate the arrival of Iron Age people at a later stage in Malnad. Further, this trial excavation has also substantiated the evidence reported from the adjacent Hallur region. Sundara while commenting on Hallur Black and Red ware from the Iron Age, remarks "The Black and Red ware pottery of the region occasionally painted in dull white glue like paste on the exterior as well as in the interior". He also opines "this tradition is derived from the Chalcolithic culture as apparent from the evidences of North Karnataka". Obviously, he is referring to the Chalcolithic White painted Black and Red ware reported from Krishna and Bhima valleys. Mixed nature of Black and Red wares of Non-Megalithic and Megalithic traditons in the site seem to have prompted Sundara to pass these remarks. As already mentioned, reassessment of the Black and Red

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ware group at Hallur may throw fresh light on this problem. Selected types of Megalithic pottery is described seperately.

Chronology: The problem of chronology of the South Indian Megalithic culture has been a matter of controversy over a century or more. Dates postulated for this culture by various authors ranged from 10th century A.D. to 1500 B.C. or more (Ramachandran, 1971). However, since the excavations at Brahmagiri (Wheeler, 1948), some order has been brought in this study. The recent excavations and field studies of various sites scattered all over Karnataka have enabled to date the culture more reasonably (Sundara, 1975). Accordingly, the Megalithic culture in Northern Karnataka has been dated to 1200 B.C. to 700 B.C. (Sundara, 1975). Now recently, the excavations of Megalithic burials at Tadakanahalli (Nagaraja Rao, 1981) and at Komaranahalli (Sundara, 1990) have been useful in dating the culture more accurately. In both these sites, the White painted Black and Red ware occurs along with Iron Age Black and Red ware. The Iron Age level of Hallur II period yielding the above wares has been dated to 1100 B.C. - 800 B.C. The Komaranahalli Megalithic pottery is dated by Thermoluminiscence method to 1200-1000 B.C. Tadakanahalli Megalithic burials have been dated to 1000 B.C. since the characteristics of pottery there, are analogous to Hallur pottery (Nagaraja Rao, 1981). Now, in the sites under study, White painted Black and Red ware and Megalithic Black and Red ware types and fabric are exactly similar to Hallur and those from Tadakanahalli and Komaranahalli excavated Megaliths. As already discussed above, White painted Black and Red ware occurs along with the Neolithic pottery at an earlier level in Malnad at Benakanahalli than at Hallur. Therefore, it appears that the White painted Black and Red ware has a fairly early beginning in the northern Malnad region and continues along with the Iron Age Megalithic pottery in the Upper and Lower Tungabhadra region. This is clearly attested by the excavations at Hallur, Tadakanahalli and Komaranahalli. In view of the above factors, therefore, at least the Megalithic cultural levels of the

habitation sites in the Upper Tungabhadra and the Lower Tunga may be dated to 1000 - 800 B.C. if not earlier. However, this suggestion has to be corroborated by systematic large scale excavations and more exact observations of the stratigraphic context of the Megalithic pottery.

Regarding the Megalithic burial sites in the Hemavati and Kaveri valleys in the southern Malnad, no materials from the sites studied are found that may be compared with those from T. Narasipur and Koppa excavations. Even the limited number of types of Megalithic burials would not help much for relative dating. However, the port-holed chamber types of Kaduvinahosalli, Beluvinakudige and Arehalli in the Malnad falling in the peripheral zone of Coorg port-holed chambers have been classified under Rajankolur type by Sundara (1975). He opines that the Rajankolur type found in Western Ghat - coastal area represents the middle phase or transitional stage developing from the preceding Konnur-Kaladgi types and is inclined to date them between 800 to 600 B.C. For the present, one can not but agree with his observations and the Malnad port-holed chamber type may also be bracketed between 800 - 600 B.C. However, excavations of these types in the region may throw more light on this problem. Similarly, the multiple circle pit burials from Sompura reminds architecturally and partially similar to multiple cist burial No. 5 at Brahmagiri (Wheeler, 1948) and No. 4 from Savanadurga (Branfill, 1881). Now, Brahmagiri Megalithic burials are reasonably dated to 800 - 100 B.C. (Sundara, 1975). Further, the beginning of the Megalithic culture at T. Narasipur in the adjacent region is dated to 900 B.C. and the end of the culture is dated on solid grounds to 1st century A.D. (Seshadri, 1971). Keeping in view of the proximity of T.Narasipur with the Upper Kaveri and the Hemavati valleys on the one hand and the architectural similarity in the Megalithic types from Sompura, Brahmagiri and Savanadurga on the other suggests a date between 800 - 200 B.C., if not earlier. However, this needs verification through further excavation and explorations. Anyway, in all probability, the beginning of the

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Megalithic culture of the southern part of the region under study is later than that in the northern part.

Further, it should be noted that from the present state of preservation of the Megaliths in the thick forest, their occurrence in small number and consequently the non-visibility of all architectural and other features, as well as the remains of burial furniture, it is difficult to ascertain the relative position of the burials both in architecture and contents, hence the dating of the Megaliths at the moment can not be based on the necessary material from the region and inevitably has to be in relation to the Megaliths of the surrounding regions.

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MEGALITHIC BLACK AND RED WARE (Surface collection)

1. Nimbegondi No. 5: Fragment of a featureless edge of a dish having straight sides and indistinct carination near the base, with presumably flat base. Black coarse core and medium section. Black polished surface both internally and externally.

2. Anavari No. 2: Fragment of a featureless, slightly incurved rim of a bowl presumably having round bottom; of coarse blackish core and medium section. Brownish red external surface and black interior surface slightly polished.

3. Hosahalli No. 3: Internally thickened and rounded rim of a bowl having convex body and presumably with flat base, of brown coarse core and medium section. Brownish red exterior and black interior highly polished. Groove along the edge internally.

4. Haraganahalli No. 1: Internally curved, thickened edge of a dish having convex sides and presumably terminating with a round bottom. Section 'C' thins towards the base. Coarse smoky grey core. Deep groove along the edge internally. Black interior and edge as well as brownish red exterior highly polished.

5. Sasivehalli No. 1: Internally thickened and bevelled rim of a bowl having two grooves below the edge externally and a thin groove along the edge internally. Patch of brownish red surface and black interior surface with both highly polished. Medium section and coarse core.

6. Belimallur No. 24: Varient of 5 but with single deep groove along the edge on the exterior. A thin groove along the edge on the interior. Black surface polished from both the sides. Medium section and coarse core.

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7. Holehanasavadı No. 2· Alıghtly outcurved featureless rım sherd of a bowl; of coarse core and medıum sectıon. Black ınterıor and exterıor surface polished. Slıghtly convex body presumably wıth round bottom.

8. Belimallur No. 13: Featureless straıght sided edge of a bowl wıth deep groove dıvıdıng the neck and the body. Thın sectıon and coarse core. Hıghly polıshed black ınterıor and patch of brownısh exterıor surface.

9. Anaveri No. 2: Out turned featureless edge of a bowl wıth concave sıdes and sharp carınatıon on the exterıor body. Black ınterıor edge and patch of brownısh red exterıor surface below carıntıon are hıghly polished. Thick edge and thın sectıoned body. Coarse black core.

10. Benakanahalli No. 16: Featureless edge of a vase wıth slıght concave sıdes and presumably wıth bulgıng body. Coarse black core and medium sectıon. Patch of brownısh red exterıor surface and black ınterıor surface as well as edge ıs polıshed.

11. Belimallur No. 14: Varıent of 10; but wıth hıghly polıshed brownısh red exterıor edge and patch of black ınterior. Graffıttı on the exterior has three strokes convergıng at one poınt. The motıf ıs comparable to No. 78 of plate no. 59 from T. Narasıpur. Coarse core and medıum sectıon.

<u>MEGALITHIC ALL BLACK WARE</u> (<u>Surface collection</u>)

12. Abbaragatte No. 3: Featureless edge of a bowl wıth almost straıght sıdes and havıng ındıstinct concave ınterıor; presumably round bottomed. Coarse black core and medıum sectıon. Black surface polıshed from both the sıdes.

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13. Abbaragatte No. 2: Varient of 12; but with slightly thickened edge of a bowl with straight sides and a deep groove along the edge on the exterior. Both surfaces slightly polished. Coarse black core and medium section.

14. Nagasamudra No. 1: Slight out turned thickened edge of a globular pot having slopy shoulders; of coarse core and medium section. Thin groove along the edge both on the interior and exterior. Polished surface.

15. Haraganahalli No. 10: Base fragment presumably of a globular vessel; of coarse blackish grey core and medium section. The disc as well as flaring body polished from both the sides.

16. Benakanahalli No. 31: Fragment of a lid of Black ware having small roundish knob and a series of grooves on the top surface. One of the circles decorated with small strokes. Coarse fabric and burnished externally.

MEGALITHIC GREY AND RED WARE (Surface collection)

17. Abbaragatte No. 5: Featureless rim of a bowl of steel Grey ware having slightly thickened edge internally. Indistinct convex body and presumably with roundish base. Burnished internal and external surface. Coarse grey core and medium section.

18. Halelingapura No. 10: Nail headed, thickened edge of a vase having concave sides; of coarse red core and medium section. Pinkish red slip; polished both internally and externally. Deep groove below the edge on the interior.

19. Holebenavalli No. 2: Featureless edge of a bowl having almost straight sides; of coarse brown core and medium section. Thin red slip on the surface. Presumably with roundish bottom.

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MEGALITHIC POTTERY

Illustrations

Index

a) Black and red ware — Sl.No. 1 - 11

b) All Black ware — Sl.No. 12 - 16

c) Grey and Red ware — Sl.No. 17 - 19.

Scale

Sl.Nos., 1, 5, 12, 13, 17 & 19 are drawn to 1:½

Sl.Nos., 3, 4, 6, 9 & 14 are drawn to 1:3/5

Sl.No., 2 is drawn to 1:3/4

Sl.No. 7 is drawn to 1:4/5

Al.Noa., 8, 10, 11, 15, 16 & 18 are drawn to 1:1

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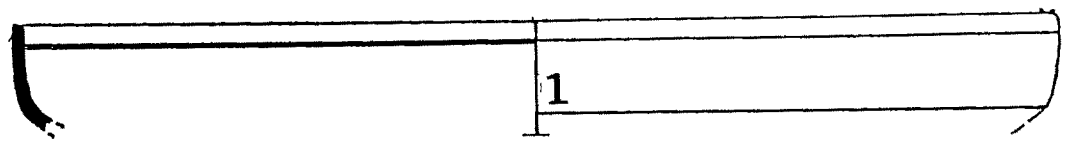
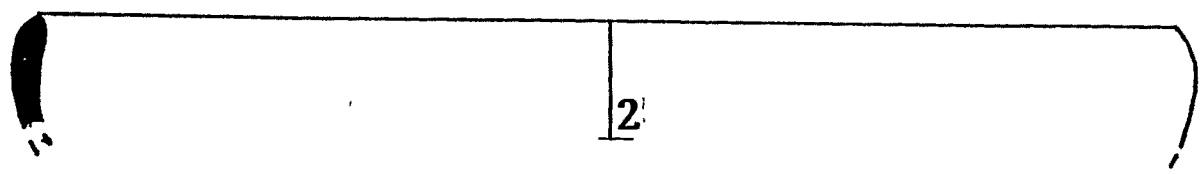
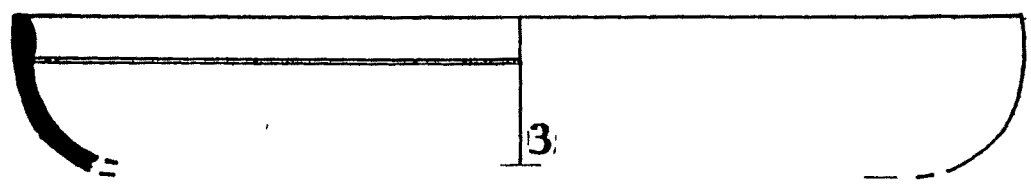
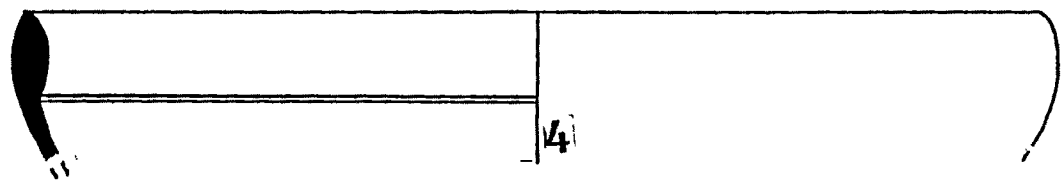
MEGALITHIC POTTERY

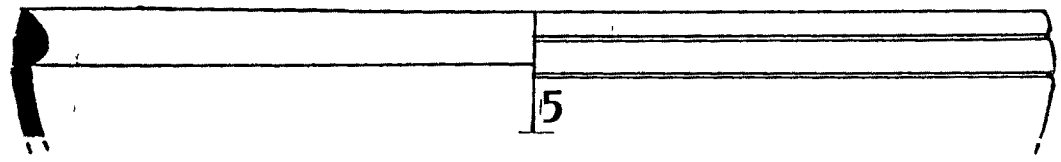
BLACK AND RED WARE

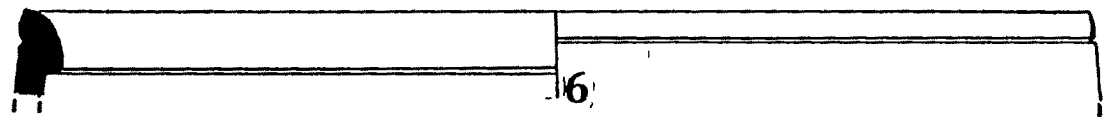


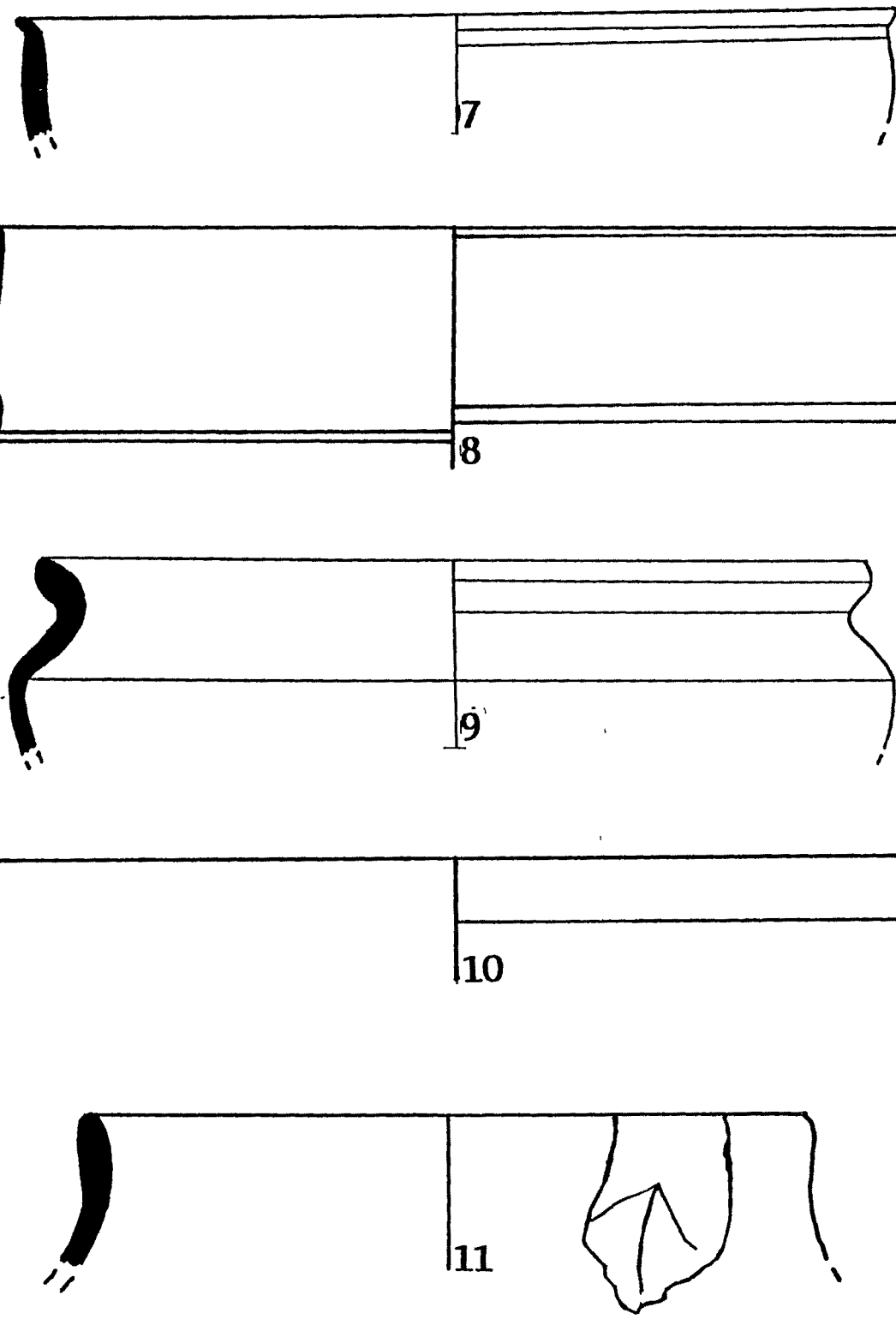












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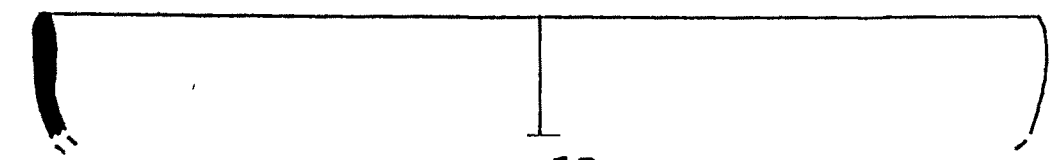
ALL BLACK WARE



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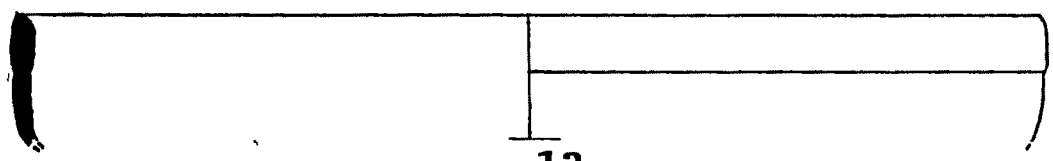

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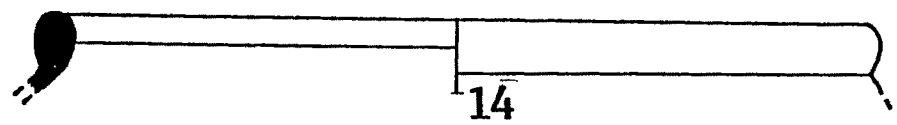

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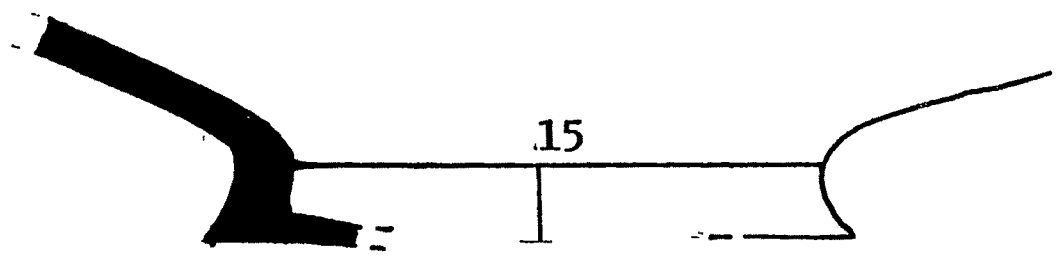

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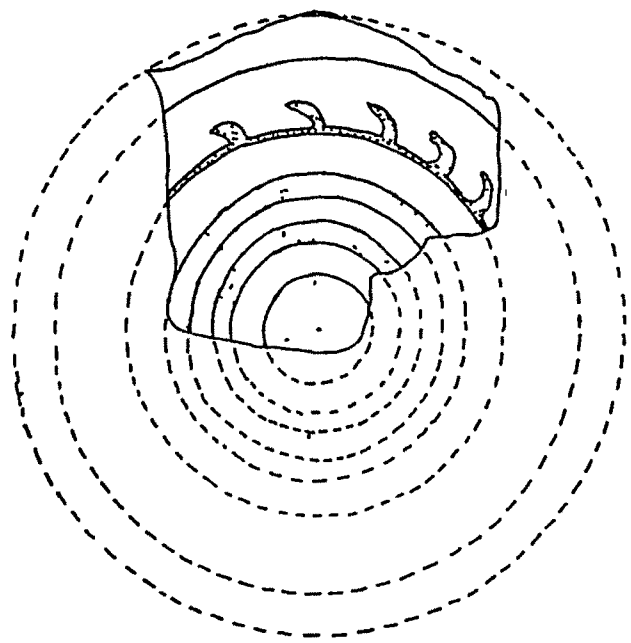

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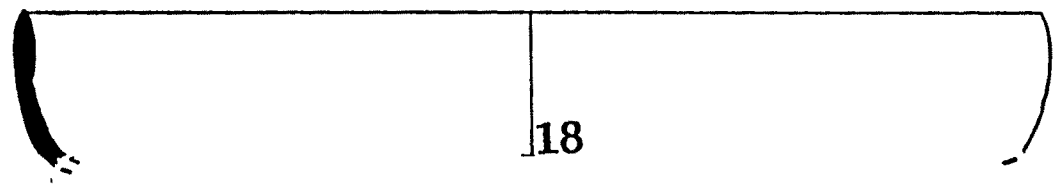
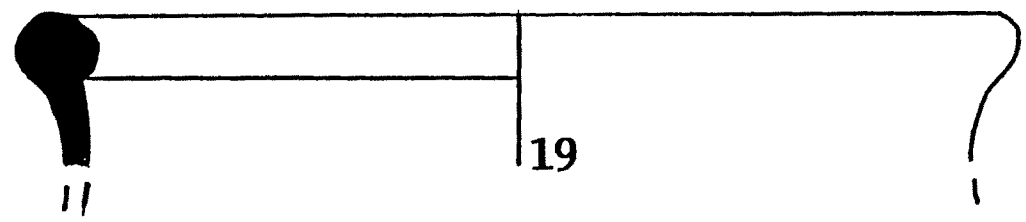
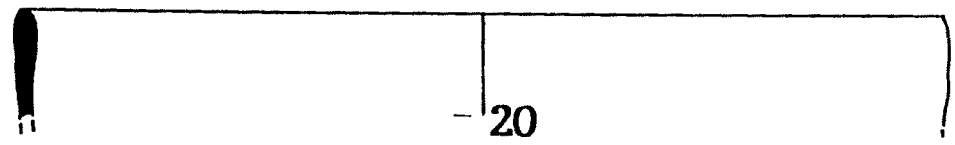
GREY WARE



RED WARE





CHAPTER VIII

CHRONOLOGY

Except a small trial digging to understand the stratigraphical position of the Neolithic ceramic industry, no other excavation is carried out in this region to discuss the chronology of the various other cultures, also there are no datable materials available. So far as the Early, Middle and Upper Palaeolithic and Mesolithic periods are concerned, we have to depend upon the comparison of the materials with those from other well studied sites in the adjacent North Karnataka region.

While concluding his observations after the typological study of the Malaprabha Palaeolithic industry, Joshi (1955) is of the opinion that the industry is mainly Acheulian and belongs most probably to the "Middle Pleistocene period". The Upper Krishna basin Lower Palaeolithic industry on typological grounds "belongs to the end phase of Middle Acheulian and therefore tentatively assigned to the Middle or Upper Pleistocene period" (Pappu, 1974).

Similarly for Middle Palaeolithic industry in the Upper Krishna basin, C-14 dates are available. The older Alluvium yielding Middle Palaeolithic artefacts there is dated to 30,000 - 39,000 years B.P. Therefore, it is of "Upper Pleistocene" period (Pappu, 1974). Deposits yielding Middle Palaeoliths in the Hunsgi valley at Wajjal has been tentatively assigned to the "Late Pleistocene" (Badam, 1979).

In the absence of faunal remains associated with lithic industries in the region under study, it is rather difficult to provide firm dating of Pleistocene deposits in various river valleys. However, on the basis of typo-technological similarities with the industries of the Malaprabha and the Upper Krishna basin, for the Lower and Middle Palaeolithic industries of the Malnad region, the probable date ranges suggested by Joshi (1955), Pappu (1974), Ansari (1970) and Badam (1979)

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for the time being may hold good.

As regards the chronological position of the Upper Palaeolithic culture in the region under study, it is necessary to have much more extensive survey. So far, only one site has been noticed in the entire region and therefore difficult to place it in proper time-scale of Pleistocene due to lack of proper stratigraphy. However, on analogy, the Upper Palaeolithic tool assemblage of the Malnad is almost akin to the blade-tool industry of the Shorapur Doab (Paddayya, 1970) which in turn compare closely with the Rallakalava industry of Chittoor district. Comparing the Shorapur Doab blade industry and Rallakalava industry, Paddayya observes "both are based on the production of blade tools and again both belong to the Late Upper Pleistocene/early part of the sub-recent period and occupy an intermediary position between the Middle Stone Age and the Late Stone Age industries".

Although clear-cut stratigraphical evidence is lacking, on typo-technological grounds, the Malnad Upper Palaeolithic tool assemblage could be compared to the Shorapur Doab industry and the date range suggested for it by Paddayya may hold good for the present.

But in so far as the Mesolithic is concerned, the recent studies in the Belan valley (Sharma, 1980), Sanganakallu (Sankalia, 1965), etc., provide a batter basis for understanding the period of the Mesolithic culture in the Malnad region.

At Sanganakallu, at least two distinct and in the Belan valley three distinct stages of the culture have been recognised. The three categories of the sites in the Malnad region broadly seem to correspond, from the point of their situation and the pattern of tool types, to the three stages in the Belan valley. The Mesolithic sites of category I invariably found in gravel exposures seem to be the earliest and may be dated between 10,000 and 700 B.C. The Mesolithic sites of the III category seem to overlap with the Neolithic culture in

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the survival stage and therefore may be dated between 5000 and 2000 B.C. The Mesolithic sites of the middle category II similar in types to those of I category but smaller in size and located in open hilly ground at higher altitude seem to precede the III category and succeed the I category, they may, therefore be dated 7000-5000 B.C.

Now with regard to the Neolithic culture of the Malnad, it is noticed that the cultural remains are more akin to those of Hallur (Nagaraja Rao, 1971) of the Upper Tungabhadra on one hand and T. Narasipur (Seshadri, 1974) of the Middle Kaveri on the other. The cultures in the latter two sites are both stratigraphically and by C-14 method are dated to 1800 to 1000 B.C. So, the Malnad Neolithic culture, therefore, may be dated to 1800-1000 B.C., if not earlier. In Hallur, the upper limit of the culture is dated to 1500 to 1100 B.C. because of the datable intrusion of the Chalcolithic culture characterised by parallel sided blades and microliths, i.e., made on fine grained rock material of black Jasper and Black on Red painted pottery pieces, of Jorwe fabric in very small number.

Although typical Chalcolithic cultural aspects are absent in the region, the White painted Black and Red ware (essentially a Chalcolithic pottery elsewhere for instance at Lothal or of Copper Age, for instance at Ahar) is found along with the remains of the Neolithic at a fairly early stage than at Hallur is evidenced at Benakanahalli trial digging. Therefore, on analogy, it could be conveniently postulated that the Chalcolithic stage in Malnad might have begun slightly earlier than at Hallur, say about 1600 B.C. upto 1000 B.C. Extensive digging of Benakanahalli site may throw more light on this problem.

With regard to the chronology of the Megalithic culture in the Malnad, in the habitation sites Black and Red ware and the All Black ware pottery are the only cultural materials noticed and these are comparable to similar pottery from the excavated sites at Hallur,

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Tadakanahalli (Nagaraja Rao, 1971, 1981) and Komaranahalli (Sundara, 1990). The C-14 dates at these three sites for ready reference are Hallur - 1105 ± 105 B.C., Tadakanahalli - 1000 B.C. and Komaranahalli - 1200 - 1000 B.C. respectively.

The latter group comprises of numerous types of burials. Of these, the Malnad port-holed chamber type on comparison to the Rajankolur type of North Karnataka may be dated to 800 B.C. to 600 B.C. while the multiple circle pit burials of Sompura may be dated to 800 B.C. to 200 B.C., if not earlier. However, these suggested dates for the Malnad Megalithic culture need verification through further explorations and systematic excavations of potential sites.

Therefore, on the whole, particularly in view of the occurrence of White painted Black and Red ware in an earlier context in the habitation on the one hand and in the burials at Komaranahalli on the other, the Megalithic culture in the Malnad may be dated 1200 B.C. to 200 B.C.

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CHAPTER IX

CONCLUSION

Prior to the explorations by me, of course, a few Lower Palaeolithic sites scattered over a wide area of the thick Malnad region were known. Since then explorations and excavations were more in the maidan area of the Deccan resulting in the discovery of numerous sites. These discoveries and the sporadic notices in the thick forest area gave a superficial impression that the latter region was not hospitable for the pre and proto-historic communities. The present explorations make it clear that the Malnad and semi-Malnad areas with thick forest in varying degrees were exploited by the prehistoric people.

Present investigations in the region under study has brought to light numerous Lower Palaeolithic sites situated in the Malnad, semi-Malnad and Maidan areas each of which is characterised by marked difference in rainfall as well as vegetation now. Sites in the 'Maidan' area representing semi-arid ecological condition account for 50%. Sites in the semi-evergreen forest area account for 32% and the remaining 18% of the sites are located in the thickly forested area. During the Lower Palaeolithic period, the ecological conditions may not have been exactly the same as now. It is probable that the present 'Maidan' area may be more forested than it is today and increasingly so in other two areas. It, thus appears that the Lower Palaeolithic man preferred the middle and lower courses of the river valleys of the region where rock material are more easily available in plenty and with penetrable forests.

The study of the stratigraphy in the river valleys of the region, revealed one aggradational deposit except in small patches at Kattebelguli in the Hemavati and Nidaghatta in the Upper Tungabhadra basin where two aggradational deposits are noticed. The gravel as well

as other deposits are found to be bereft of fossils, however, a portion of an oyster shell could be located at Hariharapura in the Lower Tunga valley. A pebble bed noticed at Hadonahalli about 1.5 Km further west of the left bank of the Upper Tungabhadra at a higher level, is noteworthy for, Seshadri (1956) mentions the presence of lower and upper gravel at Hampasagara further north in the Lower Tungabhadra valley. However, further systematic study of the formation of rivers, analysis of sediment samples and contemporary climatic changes may throw more light on the problem of the river terraces. Absence of terraces in other river valleys of the region is also noteworthy in this context.

Different rock materials have been used for manufacturing artefacts noticed in the region. These include quartzite, quartz, volcanic trap and Jasper. The most common rock material used profusely is river borne quartzite pebbles. These are of different shades with saccharodial texture, do not yield conchoidal fracture and comparatively less amenable for finer flaking. Interestingly, epidote-quartzite exhibiting fine fracture has been used at Nyamti. Artefacts made of close grained milky quartz, dyke, jasper and volcanic trap, though small in proportion compared to the quartzite group, clearly suggests that the early man in the region under study had the capacity to choose raw materials after ascertaining their granular and petrological properties.

The main tool types are chopper-chopping, hand axe, scraper, discoid, cleaver (two numbers), point and borer. Pointed tip in the pebble tool is a noteworthy feature. Bulk of the hand axes of triangular and cordiform shapes are made on flakes. Core axes noticed at Nagasamudra, Vaderpura and Bankal are heavy, devoid of secondary retouch and their crude flaking apparently suggest that these may belong to an early phase of the Lower Palaeolithic. On the grounds of the flaking technique, the pebble - hand axe group by and large

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displays different Acheulian stages. It has been possible to identify different techniques such as block on block, stone hammer, cylindrical hammer, soft hammer, etc. Although more information could be gathered about the personality of the Malnad Lower Palaeolithic culture, it is observed that these features are not different from other known areas such as Krishna - Godavari and Kortalayar valleys.

As mentioned above, only cleavers could be noticed. When compared to the numerous evidences noticed in the adjacent Ghataprabha and Malaprabha valleys, its occurrence in small number in the region under study is rather intriguing. If this is due to the rock material used which is essentially coarse grained quartzite lacking the property of yielding conchoidal fracture and hence not so favourable for fashioning cleavers unlike the close grained quartzite, is a matter for further detailed examination.

In the flake group tools of the region, occurrence of scrapers and pointed tools with their sub-types is noteworthy. Of course, there is nothing so striking regarding the tool types and the techniques employed in their making. However, these exhibit certain noteworthy features. Though the scraper tool group occurs in small numbers in each site, its total percentage in the collection is comparable to the evidences from other river valleys in the adjacent regions. Discoids made on core as well as flake are uniform in size and most of them represent employment of Levalloisian technique. Points and borers also exhibit advanced techniques in so far as the retouching of the margins and tips. These are medium to small in size. In the collection, a few blades have also been noticed which are made on thin and long flakes. All the features of scraper-point group mentioned above are indicative of a distinct Late Acheulian phase.

Similar tool assemblage has been reported from the Malaprabha basin (Joshi, 1955) and from the Upper Krishna basin (Pappu, 1974), Nagarjunakonda (Subramanyam, 1975) and Attirampakkam (Krishnaswami,

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1947) accommodating factory sites are the other two regions outside Karnataka which could be compared with the Lower Palaeolithic industry of the Malnad region. But this comparison need to be restricted only to the typological similarities. As already mentioned above, the Lower Palaeolithic tools in the region under study do not occur in clusters in the river valleys and their tributaries except in the site at Gedlahalli situated in a different geo-setting where tools occur in small clusters. The situation in the adjacent North Karnataka region is distinctly different as for example: at Khyad and Megur-Asoti (or Menasgi) in the Malaprabha basin, large number of Lower Palaeoliths are reported to have been occuring. Similarly, few other sits, for example, Pattadakal, yield considerable quantity of tools. Anagawadi in the Ghataprabha is no less prolific. Hunsgi nullah accommodates factory sites yielding hundreds of finished and unifinished Lower Palaeolithic tools.

Thus, it appears that the Middle Krishna basin with sites such as Khyad, Anagawadi, Nagarjunakonda and Hunsgi seems to be the focal region of the Lower Palaeolithic culture. The Upper Tungabhadra, the Tunga and the Bhadra along with their tributaries in the northern part of the region under study appears to be the peripheral zone as is evident from the presence of two tool type tradition, viz., the chopper-chopping and hand axe. Similarly, the Lower Palaeolithic tools in the southern part of the Malnad region could be compared with the tool repertoire (hand axe culture) of prolific factory sites at Attirampakkam, Poondi and Vadamadurai in the Kortalyar valley which seems to be the focal area. The sites in the Hemavati and the Upper Kavery valleys with chopper-chopping element may fall within the peripheral zone.

Interestingly, pebble tools occur in most of the river valleys and their tributaries in small number in this region. In the Krishna basin

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at Giddalur (Soundararajan, 1952) and in the Lower Deccan (Sankalia, 1975), occurrence of the pebble tool is noteworthy. It now appears that the area in between the Lower Krishna and the Tungabhadra valleys forms an important zone of the pebble tools characterised by chopper-choppings. Quite contrarily, most of the sites in other parts of the Krishna valley dominantly yield tools of the flake group. The present study, therefore, suggests a well defined and much better 'pebble tool zone' in Karnataka. However, this postulation poses a question whether this 'pebble tool zone' is mainly due to the availability in abundance of the rock material?

As is well known, the very terminology of the artefacts (viz., pebble tools) suggests that these are made on pebbles. However, in the region under study, not all sites yield this tool type although pebbles are available in plenty in the river bed. It may, therefore, be observed provisionally that it is the tradition and not rock material that is implied in the chequered pattern of the occurrence of two distinctive tool types, the pebble and the flake. It is also pertinent to mention here that the above observation on pebble tool zone confines to the pebble tools found mixed with core and flake hand axes and do not suggest any pre-hand axe substratum indicating a developmental stage in itself.

At Gedlahalli in particular, it is noteworthy that the usual chopper-chopping group, large hand axes and cleavers found in other sites in the neighbouring region is almost absent. Further, the size and type of tools as well as the mode of flaking seem to indicate the tools as belonging to the Late Acheulian overlapping into the beginning of the Middle Palaeolithic. Most of the characteristic tool types that become very common in the Middle Palaeolithic assemblages are already found here.

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Technologically, what is required here is the suitable rock material for preparing scrapers of smaller size which are most effective. Once the Prehistoric man began to exploit the fine grained rock materials such as chert, agate, chalcedony, etc., it facilitated him to achieve the goal. The necessary stage for this development therefore seems to has been set already in some of the sites in the region. It is from this point of view, the occurrence of scrapers and other small tool types attains greater significance. Incidentally, the sites with more number of scrapers may represent a later phase of the Lower palaeolithic. A closer observation of the features noticed in the scraper point group of the Malnad Lower Palaeolithic group in general and the tool repertoire of the Gedlahalli site in particular provides sufficient evidence to surmise that these assemblages having all the features of Late Acheulean phase may probably represent a tansitional stage from the Lower Palaeolithic to the Middle Palaeolithic. However, further intensive, inter-disciplinary study of the region may throw more light on these problems.

In so far as the geographical distribution of the Lower Palaeolithic sites in the region under study, two distinct patterns have been noticed, viz., those located (a) in the gravel bed of the rivers and their tributaries; (b) in the vicinity of lakes.

The Lower Palaeolithic culture of the region discussed above, on typological grounds on the one hand and on an analogy with the similar evidences noticed in the neighbouring region on the other may be broadly assigned to the Middle Pleistocene to the Early Upper Pleistocene period. These obsrvations are tentative especially in the light of the fact that for the first time, such a study is attempted in the Southern Karnataka region. The present field work forms only part of a vast area of research and therefore needs to be studied in detail.

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In view of the strikingly small number of sites in relation to the Lower Palaeolithic sites in the region on the one hand and to the Middle Palaeolithic in the Krishna valley (prolific with the antiquities, as for example, Salvadgi, etc.) on the other, the Middle Palaeolithic culture is not well defined and distinct as in the Upper Deccan especially in the Krishna - Godavari valleys. This may be owing to two factors, viz., the unsuitability of the rock material and less density of population of the region. But the prolific occurrence of tool types in the Hemavati valley in spite of the rock material used being not as much suitable is enigmatic. Secondly, the genetic connection of the sites in the region with those of other regions is not known since it occurs in isolation. Like the problem of the Upper Palaeolithic in India some years ago, the Middle Palaeolithic phase appears to be more a problem in the Malnad region than a regular phase in relation to the other regions. It looks as though a small section of the Middle Palaeolithic people had boldly penetrated into the more difficult Malnad region.

Regarding the rock material, what is noteworthy here is the majority of the tools are made on quartzite unlike the chert or jasper, i.e., fine grained rock materials mostly used in the Krishna valley and the Upper Deccan. The other rock materials used include chlorite schist, chert in small quantity and quartz. The occurrence of bladish flakes along with scraper-point assemblage also is enigmatic for, whether this is a development from the Middle Palaeolithic is not clear since only a stray Upper Palaeolithic site has been found in the Malnad region, and the sequence of culture is not known in a well defined stratigraphical position. Therefore, this also needs to be more intensively examined through field work. But the thick forest covering the major part of the region is a serious impediment for thorough exploration in pursuing these problems.

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The source of the chert tools noticed at Thakkanahalli is to be traced. It is learnt that about 10 Km further south of Thakkanahalli, chert is found in the schist. However, whether the chert of this area is petrologically the same as that of the tools is to be ascertained. Further, it looks as though that Thakkanahalli represents the southward extension of the Middle Palaeolithic culture from the focal area that is Krishna valley indicated by the use of chert and fewer number of the sites of the culture. In the course of the further southward movement of the people, they were compelled to adopt local rock material such as quartzite as at Govinkovi, Chikbasur, etc., and chlorite schist as at Kattebelguli, Cholenahalli in the Hemavati valley. Further, chlorite rock material is rather superior to quartzite and therefore, possibly accounts for the large number of tools in the Hemavati valley. Although the precise dating of this culture is not possible at this stage, on analogy, it may be tentatively assigned to the Upper and Late Pleistocene. Finally, the Middle Palaeolithic sites in the Malnad region probably represent the peripheral zone of the culture in the Deccan.

The discovery of only one site with the Upper Palaeolithic cultural remains indicates the existence of this cultural stage in the region and suggests further explorations for such sites is likely to be rewarding. Like the Middle Palaeolithic sites, it may also indicate the region as the peripheral zone of this cultural complex. Apart from the suggested relationship and chronological horizon on the basis of comparison , any other observations of significance on the culture can not be made at this stage.

From the above survey (Chapter VI) of the Mesolithic sites, classified into different categories in relation to their particular locations, certain interesting facts emerge.

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Use of quartz and rock crystal, the two popular rock material available in plenty in these regions is significant. Similar feature is already reported from sites in the Bangalore district (Seshadri, 1956). Although close grained chert is used in the preceding Upper Palaeolithic culture at Thakkanahalli in the Upper Tungabhadra valley, Mesolithic people who succeeded them in the same site essentially preferred quartz. Small percentage of tools are found made on quartzite also.

As already mentioned, sites are catagorised in relation to their geo-setting, viz., (I) sites on the gravel patches away from the river banks; (II) sites on the hill terraces, hill tops or at the foothill and (III) sites situated right on the river banks. Interestingly, sites of category I and II are found in the Upper Tungabhadra, the Tunga and the Bhadra valleys, but not in the Hemavati valley.

Two distinctive differences in the first two categories of sites seem to be very significant. They are (a) large sites scattered over a vast area and (b) concentration of sites in a limited area and increase in number of sites.

Though geo-setting has been taken as the main criteria for the above categorisation, it is interesting to note that the typo-technological aspects also substantiate such a categorisation. While in the first category the size and tool types are considerably more, scraper being the dominant group, the second category sites are characterised by tools of diminished size as well as variety. Tool types in both these categories are essentially non-geometric and are almost similar and exhibit continuity of tool tradition from the preceding cultures.

As noticed above, both the rock material and tool types of the two categories are almost common, the scraper-point assemblage being dominant. Therefore, the location of the sites in the hill areas

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probably indicates a later phase of culture as well as a better mode of living and exploitation of the surroundings especially from the point of view of hunting economy.

In the sites of the third category, the blade complex becomes quite distinct and small percentage of geometric type also occurs. However, absence of geometric types in the sites of this category in the Hemavati valley is noteworthy. In view of the dominant occurrence of the blade complex in the succeeding cultural stage, namely, the Neolithic, this category probably represents a transition from late phase of the Mesolithic to the Neolithic. However, this observation may not be applicable to the Hemavati assemblage which on typo-technological basis, seems to be more akin to the second category group though located in a different geo-setting, viz., near the river banks.

In the absence of stratigraphy of cultural debris, it is difficult to work out precise dating. Considering the typo-technological aspects as well as analogy to similar evidences reported elsewhere, the three categories of Mesolithic sites could be tentatively assigned to early part of the Holecene to 2000 B.C.

In view of the present density of the Mesolithic sites of the Krishna - Tungabhadra valleys, it looks as though the Tunga and the Bhadra valleys seem to form part of the focal area of the early phase of the Mesolithic culture and the sites along the western coast on the one hand and sites in the eastern Karnataka on the other form the peripheral zone.

Unlike the preceding Stone Age sites (either camp or factory) the sites with essentially Neolithic, some Megalithic, Early Historic and even few with Medieval assemblage indicate that they are regular habitation sites. In Upper Tungabhadra, their number is much more than the other preceding Stone Age sites. The spread of debris and the thickness indicate them to be regular habitation sites.

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Over a distance of about 60 Kms from Hallur to Kudli in the Upper Tungabhadra, there are as many as 17 sites, i.e., the distance between the two sites throughout on an average is about 3.5 Kms almost corresponding to the present occupation density. A few of them are located on the opposite banks, for example, Haraganahalli is opposite to Hallur and Kotehalu is opposite to Hosahalli. Some sites are larger both in extent and in volume with rich antiquities. They seem to be important villages with small villages supporting them mostly in their economic activities. This pattern seems to be the fore-runner of the pattern of town surrounded by village clusters that emerged during the historical period.

But the sites in the Tunga and the Bhadra valleys relatively speaking are few and far between. It appears, therefore, that Upper Tungabhadra was part of the focal area of the Tungabhadra valley and the Tunga and the Bhadra form the peripheral zones.

In many of the sites, especially in the Upper Tungabhadra, the remains of the succeeding Iron Age Megalithic and even early historical and a few with medieval sites with fort, etc., were evidently important political centres and suprisingly in these palces Neolithic sites - quite large in many respects - are found. Thus, the importance of these sites in terms of material culture goes back to the very Neolithic period. The Upper Tungabhadra forms a sort of cultural high way between the Maidan and the Malnad regions.

However, it is interesting to note that the ash mounds which are generally recognised as a trait of Neolithic cultural complex of Northern Karnataka is conspicuously absent in the Malnad region (Allchin, 1963). A particular point worthy of note is the occurrence of White painted Black and Red ware pottery characteristic of Early Iron Age as known at Hallur. However, trial digging at Benakanahalli has shown that in the Upper Tungabhadra, this ware, as a distinctive

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cultural trait, overlaps with the Neolithic pottery right from the earlier levels in the pre-Iron Age context. Almost upto Kudli, this pottery is found. Thus, the spread of this particular cultural element could be defined from Hallur southwards in the valley. The occurrence of the Microliths more akin to the tools of the third category of the Mesolithic complex, is appropriate for two reasons, viz., (1) the location of the Neolithic and Mesolithic sites near to one another and (2) the intimate similarity between the tools and the raw material.

Regarding the material culture of the Neolithic folk, only a few observations can be made for, our study is largely based on the explorations. Hence, a well defined sequence as well as the salient features of the culture through the period of its existence could not be known. However, the select materials explored have been systematically studied. By way of comparison with the materials from the stratified deposits and analysis, the explored materials could be better studied. It is further supported, of course, extremely on a limited scale by the trial digging in Benakanahalli which has helped in particular to ascertain the stratigraphic context of the White painted Black and Red ware in the area under study.

As already observed, the microliths, their rock materials and types are more akin to the microliths of the third category of the Mesolithic and certainly not with the parallel sided blades and microliths made on fine grained material such as carnelian, chert, jaspar of the Neolithic - Chalcolithic culture of the Brahmagiri, Maski, Nevasa, Inamgaon, etc. It is, therefore, likely that these microliths may be of the Mesolithic people in the survival stage living along with the Neolithic people there at the beginning in those respective sites. It may be recalled here that in the Kaveri valley at T. Narasipur (Seshadri, 1971), similar quartz tools were found in a pit along with cattle bones sealed by the earliest phase of the Neolithic culture there (layer no. 6). Similar tools were not found along with the Neolithic cultural remains outside the pit in any part of the

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stratified layers. Obviously, these sites were not a part of the Neolithic cultural assemblage, but belong to a small group of people in the survival stage of the Mesolithic culture. It may also be recalled here that at Sanganakallu, similar microlithic tools are found in a context anterior to the beginning of the Neolithic culture there (Sankalia, 1965; and Nagaraja Rao & Ansari, 1969).

Therefore, from the surface study, it is difficult to ascertain definitely whether the microliths in the region under study are pre-Neolithic or a survival in the early phase of the Neolithic.

Among the other stone tools, as usual, ground and pecked tools are found in varying numbers but in a few sites. The ground or sometimes polished stone tools are axe, wedge and chisel of a variety, suitable for clearance of forest and carpentary work suggesting therefore an agricultural economy too. Besides, ring stone, rubber, sling ball, saddle quern, hammer, etc., again indicate agricultural economy as well as hunting. But what is noteworthy is the occurrence of flakes, particularly polished, to make the edge sharp, in considerable number. These may be apperently the reject flakes while remaking the polished stone tools. But a close examination of the flakes reveals this to be improbable for, all the flakes so far found have polish only near the edge and on both sides. Evidently, therefore, suitable flakes were picked up and edge was sharpened by polishing both the sides to obtain effective working edge. Possibly these could be carpenters' tools for scraping as well as for cutting leather, etc. These tiny scrapers could be used for dressing fish and other acquatic food too. Even today, the river is rich in acquatic creatures. Occurrence of axes with protruded dorsal side similar to shoe-last axe type is noteworthy and could very well represent a local feature. However, the functional aspect of these is yet to be known.

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The study of animal bones retrieved from Benakanahalli trial digging indicates the environmental conditions. These bones indicate that the animals are of wild species which may throw some light on the food habits as well as hunting economy. Further, these animals were sturdy, highly agile but dwarf. This may be due to lack of sufficient fodder as well as presence of salt affecting the growth. It appears, therefore, that the ecological conditions were unfavourable besides scarcity of nutritious food.

Among the pottery, there are largely and broadly two kinds, the Grey ware and the Brown and Black ware with their sub-varieties, the former being dominant. In the excavated site at Hallur and T. Narasipur, we find these potteries in large proportions. Thus, the pottery tradition of the Neolithic culture here, both in fabric and type, is akin to those of Hallur in the Upper Tungabhadra and T. Narasipur in the Middle Kaveri. The Neolithic tool types and the pottery, their fabric and type, therefore, indicate that Neolithic culture in these respects is a part of the wide spread culture of the Upper Kaveri, Upper Tungabhadra region. Only large scale excavation may reveal the intimate similarity of the other aspects of the culture with those of these two river valleys.

There are a few scattered Neolithic sites beyond the Tunga and the Bhadra on the north and the Hemavati in the south for instance, at Nilaskal. The antiquities from the surface are too meagre to compare with their counterparts in the nearby known sites. Some of the pottery pieces in fabric have one or two unusual features as for example, the yellowish colour of the surface. Whether these features are due to the property of the local clay, as also whether this site indicates the penetration of the people from the Tunga valley or from the Hemavati or from any other area can be known by more intensive explorations. Very recently, both in South Kanara and in North Kanara, typical Neolithic tools, i.e., axe with pointed butt end have been found (Vasantha Shetty, 1989).

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As far up as Hallur in the Tungabhadra valley (Nagaraja Rao, 1971), evidence of the intrusion of the Chalcolithic cultural elements typical of the Godavari valley have been traced in the excavations also. They are Black on Red painted pottery or late Jorwe fabric, parallel sided blades, microliths made on black jasper as well as copper objects. In most of the sites in the Tungabhadra valley from Hallur below apart from the Krishna and the Bhima, even on the surface such Chalcolithic cultural remains could be picked up. Now in the sites under study, not even one site has yielded any such Chalcolithic remains. Apparently, therefore, the culture here appears to be by and large Neolithic comparable to that of T. Naasipur. With regard to the chronology, C-14 dates of T. Narasipur (1800-1100 B.C.) hold good for the Malnad Neolithic culture also since the cultural materials are almost akin to each other.

In the study of Iron Age Megalithic cultural remains in the Malnad region, two kinds of sites could be noticed, viz., the burial sites and the habitation sites. The former is found in larger number in the southern region while the latter is noticed in the northern region along the river valleys.

There are as many as nineteen burial sites scattered over a vast area of three districts. In these sites, there are now a few Megalithic burials ranging from 2 to 10-15 unlike the sites like Brahmagiri (Wheeler, 1948), Terdal (Sundara, 1966-67), Hirebenakal (Sundara, 1975) and Coorg (Subbaiah, 1978) each with several hundreds of Megalithic burials. However, the sites under study certainly were not poor originally. There must have been several Megalithic burials in each of them but most of them in course of time were destroyed due to intensive agricultural activities. What is now present is a very small fragment of once a large site. Therefore, the present numerical account is not helpful in understanding the distribution pattern of Megalithic types in each of them. Yet, there are certain important and significant points evident in these types.

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There are about ten sites together with about 50 menhirs concentrated mostly in the northern region of these sites, the one in Nilaskal being the largest having as many as 36 menhirs. In the other sites, they range from 1 to 5. It looks, therefore, as though that Nilaskal appears to be the focal area of the menhir tradition. This tradition seems to has diffused as far north as Hallur and as far south at Attapady in Kerala.

In the southern part of the region under study, especially in the Kaveri valley region, there are cist circles, Dolmenoid cists, found scattered as far north as Upper Tunga, for example; at Arehalli and Beluvinakudige. The port-hole chamber in the dilapidated condition mostly concealed under natural vegetation are difficult to be traced, hence it is rather difficult to get a fair picture of the distribution of these sites. It appears, therefore, that the southern Malnad forms the peripheral zone of the rich sites located in the Coorg region. Thus, now in this region, there are two principal traditions, the Menhir tradition and the port-hole chamber tradition. There is also an overlap of these tradition clearly indicating the contemporary nature of these two at some stage for, both at Shigodu and Pungame, there are stone circles with menhir in the circle. In Managondanahalli, there is a very clear evidence of a cist with a Menhir beside it (Sundara, 1975). In Shigodu, the two types noticed, namely, cairns and stone circles with menhir, are represented in two seperate groups indicating segregation. This feature is noticed in North Karnataka and elsewhere (Sundara, 1976). In Sompura, there is one large multiple circled cist burial. It is surrounded by couple of cist circles of smaller dimension. It looks as though that this large circle may be that of a chieftain of the community.

The habitation Megalithic remains are invariably found in the ancient sites with the Neolithic and Early Historical remains. Excepting a few menhirs noticed at Belimallur and Haraganahalli near

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the habitation sites, generally no Megalithic burial remains are found on the surface near the other habitation sites. Elsewhere in Brahmagiri, Maski, etc., Megalithic burials are found in many numbers in proximity of the Megalithic habitation sites. These sites are already described above. The occurrence of the remains of three cultures in the same habitational site is exactly similar to the excavated sites in T. Narasipur and Hallur on the one hand as well as Brahmagiri, Maski and Sanganakallu in the maidan area on the other. But in Hallur and T. Narasipur, the characteristic pottery of the Iron Age Megalithic in type and in fabric, distinctly differ to a greater extent. The Black and Red ware and All Black ware in Hallur are in type and fabric more akin to the Chalcolithic Black and Red ware found at Tekkalakota and as far north as Lothal in Gujarat. The Black and Red ware and All Black ware in T. Narasipur are more akin to those of the late phase of Iron Age Megalithic in Chandravalli and to Early Historical in T. Narasipur.

The habitation sites noticed in the region yielding Megalithic Black and Red ware and other associated ceramics on analogy could be dated to 1200-800 B.C., if not earlier. Among the burial types noticed in the region, the port-holed chamber type on a comparative basis could be dated to 800-600 B.C. tentatively. Similarly the multiple pit burials noticed in the Upper Kaveri valley could be tentatively dated to 800-200 B.C., if not earlier.

Megalithic cultural remains in the habitation sites of Malnad are the distinct bright Black and Red ware, All Black ware and Red ware comparable to those of Maski, Brahmagiri and Hallur. In Hadonahalli, iron slags were also found. In many sites in Northern and Western Karnataka, iron slags occur with remnants of furnaces. But these are almost probably of the medieval period. However, recently at Banahalli (IAR, 1985-86 - unpublished), six furnaces have been exposed in the

Megalithic level and iron slags have also been encountered. Excavation, therefore, in Hadonalli can alone definitely decide the cultural context of the iron slags.

Appendix - A

Report on the fossil sample retrieved by Shri K.P. Poonacha, Research Scholar, from a tool bearing loose pebbly gravel bed at Hariharapura, Koppa taluk, district Chikmagalur, by Dr. P.K. Thomas, Department of Archaeology, Deccan College ,Post-Graduate & Research Institute, Pune-06.

Sample sent on 28.4.1984

Report received on 30.6.1984 vide Ref. No. 701/PKT/1364 dated 28.6.1984.

The report is reproduced below

"Now regarding these specimens.

(a) is only a silica pebble and

(b) is a fragment of an oyster shell* embedded in a sandy matrix. About their age, nothing can be said unless full context of their occurrence is known".

Sd/-
[P.K. Thomas]

*Note: It is worth mentioning that oyster shell reported from Badalpur and Hiran in Gujarat is dated to 22,000 ± 2,000 B.P. where Middle Palaeoliths also occur (Agrawal, 1984). However, at Hariharapura in the Malnad, oyster shell fragment is found mixed with Hand axe exhibiting a developed Acheulean stage. No Middle Palaeoliths could be noticed.

Appendix - B

REPORT ON THE FAUNAL REMAINS FROM BENAKANAHALLI TRIAL DIGGING, DISTRICT SHIMOGA

By Prof. K.R. Alur, Dharwad

1. Introduction: Faunal remains collected by Shri K.P.Poonacha, Research Scholar, during the excavation conducted by him at Benakanahalli, Honnali taluk, Shimoga district are received for examination and report on 20.12.1989. The material is sent through Dr.R.M.Shadaksharaiah, Director (incharge), Kannada Research Institute, Karnataka University, Dharwar.

2. Description of the site: Benakanahalli is a small village in Honnali taluk of Shimoga district. It is on the right bank of the river Upper Tungabhadra, 10 km south-east of Honnali town. The mound is a fairly big one covering an area of 4 hectares.

3. Identification of the period: Trial digging in two pits together measuring 4 m east-west x 2.50 m north-south has revealed Neolithic occupation from the early levels. Five layers have been identified from the study of the sections of the trial pits and the cultural remains encountered in them. Three cultural levels have been distinguished. The earliest being the Neolithic (I) followed by Neolithic-Chalcolithic (II) characterised by White painted Black and Red ware. Level III is inclusive of Iron Age Megalithic distinguished by the occurrence of Black and Red ware and the Early Historical.

4 (a). Nature of packing: The bone samples grouped into four packets are sent in plastic bags wrapped in cotton to prevent splitting.

4 (b) Packages: (1) BNKH Pit 1A Layer 3
(2) BNKH Pit 1A Layer 3
(3) BNKH Pit 1A Layer 2
(4) BNKH Pit 1A Layer 1

5. Conditions of the bones collected· Most of the bones are highly fossilised indicating their ancestry. The process of fossilation has a minimum history of 1000 - 1500 years or more. The degree of fossilation is almost complete and is accompanied by high frequency of vibration and metallicity of texture.

6. Nature of location: Almost all the segments are azure in colour ranging from steel grey to jet black indicating their location in highly volatile situation and combustibility. Only a few are exposed to direct fire but others have been charred due to sub-terranean volatile energy. There are few bone tool pieces indicated by their external smoothness and silvery glaze. But symptoms of food habits of human being are wanting as enough evidence is not available such as chopping, stripping and extraction of flesh. The food design is not possible to visualise as the bone pieces are too fragmentary in nature. Their use as scrapers is substantiated by the use of a marine shell as scraper, the edge of which has got smoothened.

7. Wild life affinity: The gain in weight, which is nearly double when compared with the modern domestic stock, is a definite symptom of their wild life affinity. Besides, ratio of the compact tissue to that of cancellated tissue is 4 to 1 while it is 2 to 2 in the domestic stock.

All long bone pieces are practically bereft of cancellated tissue in their medullary cavity indicating the presence of anti-concussion mechanism which is another symptom of their wild life affinity.

8. Size and stature of the animals: The animals in size are dwarf, sturdy and highly agile, indicating the presence of either unfavourable ecology or scarcity of nutritious food on the site. Most of the animals are in below average size when compared to the present age stock.

In the collection, there are seven parts of long bones, five rib parts, two molars, one scapula, one vertebra and the rest unidentifiable segments including a pottery sherd and a marine shell.

9. Labelling: The segments bear the number of trench and the layer in which they are recovered.

Molars (a-1): Among the molars, one belongs to horse as indicated by the rectangular size and four internal cusps. The crown is partly worn out and four cusps with enamellar folds and internal dentine are clearly visible. The animal is aged between 7 to 10 years.

(a-2): Another is a molar of cattle aged between 4 to 7 years.

(a-3) Rib pieces: They are five in number; one belongs to bison and the other three are all belonging to cattle. One of them is carred indicating roasting of its adhered flesh for food purpose. It has become jet black due to its exposure to direct fire.

(a-4) Scapula: It is glenoid end (?) of scapula of a small anumal like sheep or goat.

(a-5) Vertebra: It is cervical vertebra of cattle as identified from its anterior articular process.

(a-6) Tibia: It is a distal end of tibia of sheep or goat.

(a-7) Long bones: There are seven bits, four belonging to cattle and three to sheep or goat. They all bear marks of roasting as evidenced by the deposition of black soot on their exterior. There is always a preference for the flesh of the sheep or goat as it is soft and palatable.

(a-8)· Un-ıdentıfıable bıts.

(a-9): Pottery sherd. It ıs a part of a Grey ware pottery.

(a-10) Marıne shell: It ıs a marıne shell and appears to have been used as a scraper. Its edge ıs worn.

(b) Packet mark: BNKH Pıt 1a, layer 3 :-

In all, there are eıght segments of whıch fıve are rıb parts and three are unıdentıfıable.

(c) Packet mark: BNKH Pıt 1a, layer 2 :-

There are ın all three bıts of bone, one ıs rıb part of bıson and another ıs that of cattle. The latter clearly shows the presence of a medullary cavıty whıch ıs absent ın the modern anımals. Thus, ıt establıshes the ancestry of collected materıal.

(d) Packet mark: BNKH Pit 1a, layer 1 :-

It ıs an unıdentıfıable bone pıece markıng the presence of medullary cavıty. It bears very thıck and compact tıssue wıth absence of cancellated tıssue.

Summary and Recapıtulatıon

Bones were fırst fıxed ın formalıne solutıon, cleared wıth Zylol and rectıfıed spırıt, mopped wıth acetone and cleaned wıth lıquid soap and dısınfected with hydrogen peroxıde.

Animals ıdentifıed are cattle (Bos-ındıcus), Bıson (Bos-gaurus), sheep or goats(Ovıdae-Caprıdae) and horse (Equus-Equıdae).

All bones are in final stage of fossilation indicating their ancestry. There are definite symptoms of the dwellers making use of sheep or goat meat for their food comsumption as they bear marks of roasting. The occurrence of the bone tool fragment corroborates the evidence. The use of marine shell as scraper is a convincing habit of their food habits.

The location is in the non-arid zone with a very few water sheds and a rocky surface. Symptoms of either domestication or herding of animals is particularly absent. It is neither animal husbandry nor agronomy zone as bones of only wild animals are recovered. In this condition, it is likely that the dwellers were nomadic with no permanent aboad. They lived entirely on the roasted flesh of wild animals as land cultivation is undiagonised. Any attempt made by them to grow food would have reflected on the bones of animals as symptoms of concussion, dipping of the neck and adhesion of vertebral segments could have been noticed. Wild animals being used for landscaping, or tilling or for drafting is unknown.

(Sd)
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FAUNAL REMAINS RETRIEVED FROM THE TRIAL DIGGING AT BENAKANAHALLI, DIST. SHIMOGA

Index

Plate No. I : Bones of cattle, sheep, etc (domestic).

No. 1 : Tibia of sheep or goat

No. 2 and 3 : Ribs of cattle

No. 4 : Roasted rib

No. 5 : Marine shell (used as scrapers)

Plate No. II : Bones of wild animals.

No. 1: Rib of cattle (large sized)

No. 2: Rib of cattle (small)

No. 3: Long bone of sheep or goat

No. 4: Scapula of small cattle

No. 5: Matacarple head

No. 6: Vertebra

No. 7: Rib of large animal

No. 8: Molar of cattle

No. 9: Molar of horse

LIST OF ABBREVIATIONS

A.I. : Ancient India (A.S.I., New Delhi)

Art.As. : Artibus Asiae (Aseona, Switzerland)

I.A. : Indian Antiquary

I.A.R. : Indian Archaeology, A Review (New Delhi)

J.A.S. : Journal of the (Royal) Asiatic Society of Bombay (Bombay)

J.A.S.B. : Journal of the Asiatic Society of Bengal (Calcutta)

J.B.O.R.S. : Journal of the Bihar and Orissa Research Society (Patna)

J.R.A.I. : Journal of the Royal Anthropological Institute of Great Britain and Ireland

P.A.S.B. : Proceedings of the Asiatic Society of Bengal (Calcutta)

Q.J.M.S. : Quarterly Journal of the Mythic Society (Bangalore)

R.A.S.I. : Report of the Archaeological Survey of India

T.A.P.S. : Transactions of the American Philosophical Society (Philadelphia)

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